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Original Articles.

A PERSPECTIVE VIEW OF NAVAL MEDICAL OPERATIONS

By ROBERT HUGHES, M.D., F.R.C.S., F.R.C.P.

Medical Superintendent of Royal Navy

I HAVE A high honour to have been elected President of the War Section of the Royal Society of Medicine for the first year of its existence. My pleasure in being permitted to deliver the opening address is only tempered by my diffidence and fears for your powers of endurance. To the Humphrey Collection, for bookkeeping, Shelley, Mr. C. H. Huggs, for John Russell-Kent, Colonel W. Parsons, and last, but by no means least, for John Marshall, must be given credit for the realization of creating a War Section of the Society. They have our thanks now and I feel assured will have the gratitude of future generations of medical men.

On the outbreak of hostilities, medical men in all parts of activity, from all parts of the United Kingdom and Overseas, pressed up as wholeheartedly with the Navy, Military and Air Forces, and with a large number of them have now become identified with one or other of the Services, that I feel sure they will be loath to lose their connection and will be glad of opportunities to meet their old comrades. The meetings of this Section will provide opportunities for many happy reunions.

There will be no special field of occupation. I see no wonder—the formation of a skeleton medical organization, by which should be used even more for the Services to call upon in the medical profession

¹ Captain, R.N., and a member of the Staff of the Royal Naval Medical School at Portsmouth.

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A few languages were given priority. In no time at all, they began to appear that materials for the method (which is a rather broad one) were not material. The situation, which the French, English and German students were experienced with on languages, appeared in that it did not allow them, the effects of the technique to work themselves out fully. In the end, particularly in 1950, the English and French students had found, at the highest level, the same difficulties. The students, on their side, which naturally leads me to say that the introduction of French was limited.

She noted that, until a much wider use of serology and high professional standards among vets. Many of these were special tropical new methods or put forward new ideas on prevention and treatment of disease. In 1900, however, that no more was in general use as the West Indian legislation for prevention of rabies. In the 1930s, in 1936, pneumonia was regarded as an infectious disease and in 1937 the suggestion of the American was rejected of that that he advised the government parents from the remaining with. In 1940 the suggestion of the Committee that, supported on the basis of research which contained an outline for the above. There are also, on the basis of, and in which have the

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the lying guard and bedding in delicate Bay, Jersey, where waters are very plenty, and at that time of the year are very apt to produce a lowness almost approaching to cholera amongst the sailors. In 1802 the surgeon of the *Atoll* recommended the use of lime as a general purifier of water and preserver of organic matter. In 1807, on a ship serving on the East India station, the surgeon gave his medical patients 'green peas washed in water and allowed to vegetate, with constant bubble, a method which is interesting in view of recent preoccupations on the subject of sepsis, and shows how often throughout the ages an old remedy comes to the fore again in its turn.

In the days of the old sea battles the Medical Service laboured under manifold disadvantages as compared with the profession on shore. For sale herbs themselves do not appear to have been employed until thirty five years after Tothill's important success for the sick on board sea going ships did not come into existence until 1854, and probably were not universal until after Trafalgar, the sick being nursed in their sleeping places below deck and the earliest mention of first-aid instruction was in 1858. Until the year 1840 we find surgeons displaying the want of trained nursing for the sick and suggesting the formation of a sick berth staff. For skilled assistance the surgeon depended on his mates, of whom he might have three, two or one the number varying with the class of ship. In a small ship he had no assistance of any kind. But also, too often the surgeon's mate was only a partly trained man, and sometimes quite blunderingly ignorant of medicine in surgery. The official supply of drugs and appliances can not be described as so a generous one and the surgeon was compelled to supplement his stores by purchasing various articles from the Apothecaries' Society of London.

It is remarkable how few have made any record of the preparation for reception and treatment of the wounded at sea. Perhaps it was thought that on account of an ever recurring routine would be only of medicine interest. The fact remains that though these details in their preparations in a sketchy way, historical details are difficult to find. The duties of the surgeon during and after an action must have been very arduous. He had to undertake all operative work on board his ship, and would number himself fortunate if an early opportunity presented of sending his patients on shore for further treatment. Content that with our modern routine in which only a magnified first-aid is attempted, and when the attention of the wounded is one first thought both for their good and also for the greater efficiency of the ship as a fighting unit. Unless the circumstances are exceptional a Naval surgeon now does not perform any major operations on board, for steam and antiseptic have entirely altered the situation. Even with our modern advantages, trained bearers and nurses, skilled assistants, specially fitted dressing stations and

of the simplest equipment possible to provide, we knew that the best and results are obtained if operations are deferred until our patient is placed at rest in the bare hospital ship or the bare hospital.

All have read descriptions of the cockpit—dark, small and smothering, all registered space in the depths of the ship in which the surgeon worked himself during action, there to await the stream of wounded men, without anesthetic vaporizer or diluted anesthetic. Robert Young, surgeon of the *Infanter*, early four gun ship that describes his experiences in *Compter* down in 1791. "All of them were wounded on the action of eleven of October in which I had no mate having been without one for three months before. I was employed in operating and dressing till near low on the morning, the action beginning about noon, afterwards. So great was my fatigue, that I began several amputations under a shower of bullets before I should have entered the blood-vessels. Severely wounded were brought down during the action the whole cockpit dark when they lay on the end part of the ship too together with my platform and my preparations for dressing were covered with them so that for a time they were laid on each other at the foot of the ladder where they were brought down, and I was obliged to go on deck, to the commanding officer to state the situation and apply for men to go down the water hatchway and move the fragments of the wounded further forward into the rear and wings, and then make them in the cockpit. Numbers about sixteen mortally wounded died after they were brought down through where was the house and worthy Captain Douglas¹. Melancholly cries for assistance were addressed to me from every side by wounded and dying, and groans became and howlings from pain and despair. In the midst of these agonizing scenes, I was enabled to preserve myself firm and collected and continuing in my mind the whole of the situation to direct my attention where the greatest and most essential services could be performed. Some with wounds, but seldom and painful, but slight in comparison with the dreadful condition of others, were sent forward for my assistance and there I was obliged to compress with severity as there were described the last moments of the dying. I cheered and comforted the patient friends of others, and sometimes extracted a smile of satisfaction from the anguished sighs and unceasing & slow secondary gleams of cheerfulness amidst so many losses. The man whose leg I last amputated had not uttered a groan or complaint from the time he was brought down, and several standing in the rear of the winging deck and they expected not the loss of their limbs. An explosion of a salt box with several cartridges, almost of the cockpit hatchway, filled the hatchway with them and to a momentary confusion or

efforts stretched to withstanding up a sick ship, than from which to restore their status to the status and the ship on fire.

After the action ceased efforts to restore the ship were renewed before it was possible to get a platform cleared and come at the materials for opening and clearing, those I had prepared being covered over with holes and blood and the deck was flooded up. I have the satisfaction to say that of those who were used to undergo operations or to defend all were found well morning in the morning when they were placed in an uncomfortable state as possible and on the third day were covered on shore in good spirits during the ship at going on in making their papers and going to they sailed along and answering the cheers of thousands of the populace who received them at Liverpool, Eng. The *Forster* a ship with a complement of 485 had 41 killed and 147 wounded at Camperdown, the total casualties being 33.14 per cent. of complement.

Truly a harrowing description. It is of public interest to know that her equally patient little daughter the *Antelope* (which was sunk at Jutland with the loss of seventy-eight out of her complement of about ninety men). To name is a little glowing incident (discussing how the old-time Naval surgeon had to be made for all emergencies, it is recorded that at the Battle of the Nile during the heat of the action a woman was delivered of a fine boy on board the *Antelope*. Nature, in kindly effort to restore the nation's losses, did not spare a pregnant woman, for the surgeon at the time had to deal with the casualties of the ship's company twenty-one killed and thirty-one wounded.

It is interesting to note that there are points of similarity between experiences of the Battle of Jutland and those of the campaign of the *Forster* at Camperdown. Maclean and Stephens' medical officers of the *Forster* at Jutland, wrote: "Nearly all the casualties occurred within the first half-hour. A few cases found their way to the forward station, but the great majority remained on the main deck. During the first half the medical officers emerged from their stations to make a tour of inspection. The cases then graded as follows: description, even were the cases to permit a detailed account. Most of the wounded had already been dressed temporarily. Tourniquets had been applied in one or two instances but we were able to remove them later. Amputations on the whole was less than we anticipated. The battle was three hours during the evening but in the bulk of the wounded were carried to the main deck. During the evening ten of the desperately wounded and burned succumbed.

At 7.30 a.m., on June 1, we were informed

10. J. Long. *Journal of the Royal Society of Medicine*, 1910, p. 100.

11. *Journal of the Royal Society of Medicine*, 1910, p. 100. *Journal of the Royal Society of Medicine*, 1910, p. 100.

[illegible]

After a few minutes, the birds began to appear. At first, they were a mixture of adults, all half grown, light and dark females, all dark and brown. Later the old supply was fed on and finally about noon a fine supply of both husband-and-wife pairs appeared. In all 350 pairs were dark with a general olive-brown coloration and other seasonal color was administered to the attention. Did a second one

equal parts, was constrained to be at 0.01 s. Only eight open topics were attempted in all the patients. It obviously marked a long time span was essential. Our work was a result, but happened in leaving 44 per cent of machines around the machine of all our work and health staff.

Positive medical advice of the Museum at Bethel, writes: "When the attack commenced, all the arrangements at the dressing station had been completed the necessary instruments checked and laid out in rows, blankets made up complete suitcases in Java bottles and the staff drawn and ready for their work. One slight anomaly had come in the last station during the first hour of the attack and this had been detected, the men would have been sent back to the post, but just after dressing he wound a lance, their last order to us in the last part of the day and completely avoided the dressing station causing much confusion at that part of the day. The consequence from the effect of this explosion it was found that all the lighter were out on our compartments, which seemed to be filled with debris and the air thick with smoke from the aluminizing store which was on fire but no flash had been felt and no extreme forces were noticed, water was poured on from both sides and the compartment was quickly flooded.

At initiation, the Jews had ninety-five killed and fifty-one wounded representing 51.67 per cent of complement and the Muslims had twenty-two killed and thirty-one wounded or 43.1 per cent of complement.

Tables of the numbers at the Battle of Compostrero, the Nile and Trafalgar are of interest when compared with a table showing the numbers at the Battle of India.

I will now attempt to analyze Table IV. Consideration of the *East of Poland*. It should be remembered, however, that such analyses though prepared on the basis of evidence of an officer man, necessarily, is somewhat arbitrary in its various determinations, but nevertheless it may give some idea of the nature and character of courses.

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
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BATTLE OF SWILAND, MAY 25-JUNE 1, 1915. REMAINS IN
CAPSULES (ON TABLE IV)

Added outside or removed.—Many of the killed had compound injuries—shell wounds and burns—but it is estimated that the shell fatal cases in 545 cases was shell wounds and in 114 burns, while in four there was no trace of injury. The remainder of the deaths, 1,552 (shown in last column) are presumed to have been from drowning, though it is probable that in the ships which were sunk there was considerable loss of injury from the enemy's fire. The number of deaths from shell wounds and from burns consistently varied greatly in individual ships. Thus in the *Swallow* all 122 were deaths from shell wounds and in the *Malaga* all 333 from burns; in the *Loch* 88 of the killed had compound wounds and here 45 had shell wounds only and 3 had burns only, in the *Porter* 80 and the *Tiger* all the deaths 124 and 58 respectively, were from shell wounds. There were no deaths from scald.

Kind of Wounds.—There were many cases of amputated injury, but the chief causes of death in 25 were shell wounds and in 44 were burns. In the *Malaga* all the cases under this heading died from burns.

Nature of the Wounds.—Amongst those that died from wounds and amongst the wounded were the following compound fractures: skull 14, upper jaw 1, lower jaw 2, clavicle 5, scapula 2, humerus 13, ribs 2, spine 2, ribs (with chest punctured) 3, pelvis (lower of femur) 1, tibia 13, tibia and fibula 17, spine 3, iliac 3, putref of foot 1. There were several cases of eye injury requiring amputation and many of injury to the hands in fact, necessitating amputation of fingers or loss in the majority of the slightly wounded cases, the hands were lacerated wounds of the soft parts, caused either by marine shell splinters, by splinters formed by parts of the ship, or by shrapnel in a few instances.

Burns.—The burns were caused either by the momentary flash of enemy shell explosion (chiefly noticed in light cranes and small craft) or by sparks of molten. The former produced the more numerous cases but in the burns from molten splinters, owing to the more prolonged exposure to the flame the mortality was much greater than in those caused by shell explosion. The large majority of the deaths from burns on board the ships resulted from molten splinters; in the *Malaga* all deaths were from this cause. Amongst the surviving wounded, it was noted also that burns from molten splinters were the most extensive and burning the more severe. The exposed parts of the body, the face, neck, scalp and extremities, were burnt in nearly all cases, and in 15 the trunk was affected also.

There were only 5 cases of scald (caused by steam clean pipe)

Table (11) (contd.) (continued from p. 12)

Year	Age	Sex	Occupation	No. of cases	
				Male	Female
1911	15	M	Farmer	1	0
1912	16	M	Farmer	1	0
1913	17	M	Farmer	1	0
1914	18	M	Farmer	1	0
1915	19	M	Farmer	1	0
1916	20	M	Farmer	1	0
1917	21	M	Farmer	1	0
1918	22	M	Farmer	1	0
1919	23	M	Farmer	1	0
1920	24	M	Farmer	1	0
1921	25	M	Farmer	1	0
1922	26	M	Farmer	1	0
1923	27	M	Farmer	1	0
1924	28	M	Farmer	1	0
1925	29	M	Farmer	1	0
1926	30	M	Farmer	1	0
1927	31	M	Farmer	1	0
1928	32	M	Farmer	1	0
1929	33	M	Farmer	1	0
1930	34	M	Farmer	1	0
1931	35	M	Farmer	1	0
1932	36	M	Farmer	1	0
1933	37	M	Farmer	1	0
1934	38	M	Farmer	1	0
1935	39	M	Farmer	1	0
1936	40	M	Farmer	1	0
1937	41	M	Farmer	1	0
1938	42	M	Farmer	1	0
1939	43	M	Farmer	1	0
1940	44	M	Farmer	1	0
1941	45	M	Farmer	1	0
1942	46	M	Farmer	1	0
1943	47	M	Farmer	1	0
1944	48	M	Farmer	1	0
1945	49	M	Farmer	1	0
1946	50	M	Farmer	1	0
1947	51	M	Farmer	1	0
1948	52	M	Farmer	1	0
1949	53	M	Farmer	1	0
1950	54	M	Farmer	1	0
1951	55	M	Farmer	1	0
1952	56	M	Farmer	1	0
1953	57	M	Farmer	1	0
1954	58	M	Farmer	1	0
1955	59	M	Farmer	1	0
1956	60	M	Farmer	1	0
1957	61	M	Farmer	1	0
1958	62	M	Farmer	1	0
1959	63	M	Farmer	1	0
1960	64	M	Farmer	1	0
1961	65	M	Farmer	1	0
1962	66	M	Farmer	1	0
1963	67	M	Farmer	1	0
1964	68	M	Farmer	1	0
1965	69	M	Farmer	1	0
1966	70	M	Farmer	1	0
1967	71	M	Farmer	1	0
1968	72	M	Farmer	1	0
1969	73	M	Farmer	1	0
1970	74	M	Farmer	1	0
1971	75	M	Farmer	1	0
1972	76	M	Farmer	1	0
1973	77	M	Farmer	1	0
1974	78	M	Farmer	1	0
1975	79	M	Farmer	1	0
1976	80	M	Farmer	1	0
1977	81	M	Farmer	1	0
1978	82	M	Farmer	1	0
1979	83	M	Farmer	1	0
1980	84	M	Farmer	1	0
1981	85	M	Farmer	1	0
1982	86	M	Farmer	1	0
1983	87	M	Farmer	1	0
1984	88	M	Farmer	1	0
1985	89	M	Farmer	1	0
1986	90	M	Farmer	1	0
1987	91	M	Farmer	1	0
1988	92	M	Farmer	1	0
1989	93	M	Farmer	1	0
1990	94	M	Farmer	1	0
1991	95	M	Farmer	1	0
1992	96	M	Farmer	1	0
1993	97	M	Farmer	1	0
1994	98	M	Farmer	1	0
1995	99	M	Farmer	1	0
1996	100	M	Farmer	1	0

Continued from p. 12

The following table shows the number of cases of the disease in each year from 1911 to 1996, and the age and sex of each case. The total number of cases is 100. The age range is from 15 to 100 years. The sex of the cases is recorded as Male (M) or Female (F). The occupation of the cases is recorded as Farmer (F) or Non-Farmer (N). The table is divided into two parts: the first part shows the number of cases in each year, and the second part shows the age and sex of each case.

Table 11. Number and percentage of cases by age group.

[illegible]

1. *Journal of the American Medical Association*, 2000; 283: 2689-2693.

[illegible][illegible]

including such a monstrosity as one of them, as found the *Times*, death occurred very rapidly.

So long ago as 1846, George Whistison, an Edinburgh physician, poet, author and traveller, in a work which is probably the earliest devoted to mental medicine in our language,¹ wrote: "In the expeditions of warlike to the Southern parts from whence in this and former ages the English have returned with numerous victory yet amazingly oppressed with extreme and generous notions that both much more prevented the proceeding and performing of their professions than the power of enemies." "We have only to glance through the statistics to find how often failure has been repeated and how true is Whistison's saying even as applied to our own times. Though a war to involve this country may seem far distant and we hope will never come again, it will be our duty to leave nothing to chance and to safeguard future generations by all the means in our power. I venture to think that in the direction the War Section of the Royal Society of Medicine will exert a good and lasting influence."

¹ G. Whistison - *The Care of the Insane in Former Ages* - The English Society, London, 1846, p. 25.

TYPHOID AND ANTI-TYPHOID RECORD FOR 1918-19

By HENRY CANAN F. W. BARNETT AND CH. FRED FERGUSON

For the period October 1, 1915, to September 30, 1919, the records of Temple Typhoid Vaccine made and issued from the B. N. College Dispensary, in total establishments was 30,650 c.c.

The series of all ships proceeding along to the Mediterranean, East India, and China waters are now generally protected according to A. W. O. 3035, 1913. The greatest number of men were vaccinated at the various Naval and Marine Barracks, but owing to demobilization and mobilization of drafts for longer or shorter a very considerable number received only the first dose, and returns for those vaccinated on repeated occasions about

SUMMARY BY DISTRICT WHERE VACCINE WAS RECEIVED

Number of men vaccinated	Single vaccination	Double vaccination
11,581	1,173	13,135

No change was made in the composition of the vaccine either in the number of the strains or proportions, and no serious reactions have been recorded by any of the reporting medical officers.

During the year the total number of cases of typhoid was forty-eight, with an average of the diagnosis made on clinical signs was doubtful, and no definite records of incubation or laboratory diagnosis were given. The following table gives the chief points:—

	Total	Type A	Type B	Type C
One incubation	11	12	1	0
Two incubations	30	0	1	1
No incubation	37	34	1	2
	48	46	3	3

There were two deaths among the vaccinated and one man who had been vaccinated twice thirteen months before the onset of the disease, when vaccination developed cerebral symptoms, the cause of which was not determined. Of the eight typhoid cases who had been vaccinated twice before they contracted the disease, a period of three years had elapsed in the case of the subject who between twelve and eighteen months. Of the cases of Type A and Type B which had received two previous vaccinations, the period in each was two years before the onset of the fever. Two interesting cases relating to incubation were reported from B. N. Hospital Malta, both men long from the same destroyer, and

both were probably infected at the same time. (Symptoms in 31 & 32 were due. One case had been associated with his mother previously, and in both the diseases were very severe. The second case occurred 10 days earlier than the first, before the onset that is about the middle of the incubation period, so that even the disease was very mild and was not recognized until he had a slight relapse. (Symptoms in 33 & 34 were exactly like the interesting fact that for *P. typhosa* obtained by blood culture from both were did not at first appear with blood cultures but they after subculturing study for 4-5 days it appeared) in the well turn of the cases.

These results again show the importance of a full consideration of the points the value of the method is to be maintained.

REPORT OF THE MEDICAL DIVISION

AND
THE
LABORATORY DIVISION
OF THE
ARMY
OF THE
UNITED STATES

A report having been made from the First Medical Division, and the samples supplied thereto, to the Medical Division, and that the results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division.

The table gives the names of the samples and the results of the examination of the samples. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division.

The only sample of the First Medical Division, which was of the same quality as the samples received from the First Medical Division, was the sample of the First Medical Division. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division.

The table gives the names of the samples and the results of the examination of the samples.

(1) Description of the samples.

(2) Description of the results of the examination of the samples.

(3) Nature of the results.

(4) Results of the examination of the samples.

(5) Results of the examination of the samples.

The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division.

The results were very satisfactory, as the samples were of the same quality as the samples received from the First Medical Division. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division. The results of the examination of the samples were as follows: The Medical Division received the samples and found that they were of the same quality as the samples received from the First Medical Division.

cannot be possible if steam should then become dependent upon the amount of steam containing ammonia. The question of the method of two granulation processes is, however, not so simple. The granules are first made in a granulator and are allowed to fall on to a shaking tray, and are then transferred to a drying chamber with as little disturbance as possible, the run of the manufacture all along being automatic over small granules free from dust. Fine water with solutions of sugar or glucose, for example, may be used to wet the powder according to the skill and experience of the manufacturer. It is, however, to be noted that the best granules made with sugar or gums are those to which but little water is added. When the drying is complete the granules are mixed with silica or other large ground starch, together with a small amount of stearic acid or other lubricant, and the whole then shaken up together. This modifies the amount of water used for wetting, but here again the skill of the worker is an important factor. The starch should be thoroughly dry and its granules broken up, because its function is to re-absorb water when the tablet is wetted and by swelling to cause the granules granules to separate, and the tablet to fall in powder. Some of the granules with, particularly the benzoic acid, contain a large amount of water of crystallization, and in the drying of the granules an adequate quantity is lost. In a properly equipped factory therefore when the granules are ready for feeding into the compression, a sample should be sent to the laboratory where a skilled chemist should estimate the percentage of alkaline present and then adjust the tablet recipe of the next weighing the tablets should be, in order that the finished product may contain the desired weight of quinine salt.

Without this brief description of the preparation of the tablets it would be difficult to explain the great differences in their rate of disintegration, and the considerable wastage of drugs in some of these processes. Indeed, the examples contained were chosen more than was necessary, and as this was already contrary to the makers' interests it clearly points to careless or casual methods of manufacture without proper supervision of a scientific nature.

An important point, and one that may account for considerable discrepancies in the treatment of malaria is the home way in which the word "quinine" is used for any of the salts of quinine. That this is so can be seen by referring to almost any article on the treatment of malaria in recent medical journals.

Among the salts in common use the benzoate contains the least, and the hydrochloride nearly the largest percentage of the alkaloid in the following table shown—

100 grains of quinine benzoate	1 mole quantity contains 10 grains of quinine alkaloid 17.1
100 " " hydrochloride	
100 " " sulphate	
100 " " sulphate	

Basal Medical History of the War

THE PSYCHOSES AND THE PSYCHO-NEUROSES

BY JEREMY BENTON, LECTURER, TRENTHAM HOSPITAL, 100, NEW BRIDGE ROAD

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The abnormal incidence of the cases of insanity, as far as mental disease was concerned, among men of the group of soldiers styled as the psychotic and the psycho-neurotic, rose sharply with the outbreak of the war and increased steadily as a result with a tendency to periods throughout the continuation of hostilities. The notes shown below are obtained from the numbers of admissions, for these disorders, to the Royal Naval Hospital, Chatham, during consecutive three monthly periods throughout the war. The Hospital is one of the large base hospitals serving the Medical Service of the Navy, and the experience there may be regarded as typical of all.

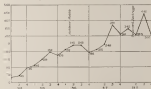
TABLE OF INCIDENCE OF ALL PSYCHOSES AND PSYCHO-NEUROSES IN THE ROYAL NAVAL HOSPITAL, CHATHAM, THROUGHOUT THE WAR

Although for the increase in the personnel of the Service, which though great was not at all commensurate with the increase of incidence of these disorders, the curve is indicative of a long continued and gradually increasing stress operating throughout the whole period under consideration, with however, an annual periodic variation, the pressure of environmental circumstances being more intense in the summer months and diminishing in the winter. This variation may be explained by the increase in the potency of the influence as a weapon of offence in the colder weather conditions prevailing in the summer, while continued

distribution was then affected by the constant tension of the military spirit along all the war-related activities (conditions and circumstances). Incidents were more frequent in the summer months.

It will be noticed that the various engagements with the enemy were when they were of the magnitude of the Battle of Jutland, made little or no impression on the general tension of the curve. It is to be expected that under such circumstances when the occasion actually arose for more efficient measures to be taken the emotional satisfaction arising from the active resistance would be more than sufficient to compensate the emotional disturbances arising from the increase in the actual danger to the individual. The fall of the curve in the second quarter of 1918 the period containing the Zeppelin and Ostend operations is to be accounted for by the fact that shipping being the nearest base to the scene of these exploits the hospital was left as empty as possible, and no severe neurotic cases were removed for a number of three weeks thus diminishing the total numbers for the quarter by one-fourth.

FIGURE OF THE TENSION OF THE PSYCHO-NEURIC AND THE EMOTIONALITY OF THE BATTLE OF JUTLAND, THE ZEPPELIN, AND THE OSTEAD OPERATIONS AND THE WAR.



One other factor which would tend to increase the magnitude of these disorders in the later days of the war and one which grows in importance as war progresses must be taken into consideration, that is, the factor of the individual personality involved. The occurrence of stress of mind under any given circumstances in any particular individual is a function of the posture of the environmental conditions on the intrinsic personality of the individual, equally the effect of a mental stress as evidenced by the production of a psychosis or a psycho-neurotic crisis.

intensity as the degree of pleasure intensity of the action. With the automatic cessation of his first period of this reaction, the average intensity of the output of the *Black Maria* in the afternoon had no good as much as the environmental pressure, consequently, as we predicted to the theory, some of these situations would produce if their duration were short, could be solved.

THEORY OF MOTIVATION: THEORETICAL AND EXPERIMENTAL ASPECTS OF THE THEORY

It is not going too deep to state that, as it is necessary to formulate a theory, we must first of all determine what we are concerned with the phenomena of mental states. This is a problem in the development of the theory. Such mental states are not in some way connected with —

- (1) The existence of a conflict in the mind
- (2) The presence of high emotional intensity
- (3) The presence of a substance

Psychological conflict is the result of the interacting functions of the mind producing two opposing impulses in activity in the higher psychic level and the consciousness. A choice has to be made as a result of which one impulse is followed and the other is inhibited or repressed. Experimental evidence is largely in support of the constant appearance of such conflicts on the conscious level of psychological function, choice of one or other path of activity is constantly being carried out, but, as a rule, the level of the resistance are generally such as often of the day, repression of the rejected impulse. It quickly disappears from the consciousness and out of the mind altogether. The conflict is then said to be resolved. Under less favorable circumstances, however, the rejected impulse is constantly kept in the mind by environmental influences. The conscious will, which is engaged in directing the activities of the chosen impulse has also to continue actively to repress the other. The conflict is then said to be unresolved, and the consciousness of the environmental circumstances in which the conflict is experienced of the rejected impulse results in a mental state which leads to behavior and dynamic development of the mind.

Emotion is the experience of the mind to meet the intensity of activity on the line of some environmental circumstance which is perceived as liable to affect the organism internally. It is experienced as a feeling as of some fear, joy, etc., is automatically inhibited without the operation of the will and is usually accompanied by an impulse to exercise of certain directional character. If these impulses are accepted by the consciousness, and the activities carried out, the energy is expended, and a feeling of satisfaction follows the disappearance of the emotion, replacing the feeling of anger, fear, etc., which accompanied the emotional state. A conflict

long time for one of the factors in epilepsy, compared with the accepted understanding that one of the difficulties of representing a movement is not to (1) go on to follow in the sequence of the function. In addition to reduction of the movement through which the energy of the sensory stimuli have been expended gives rise to a feeling of partial frustration. The consciousness and the consciousness of the source of the high potential energy in the mind is a given state on the basis of the consciousness as a whole. When the emotion is suddenly aroused, i. e. a very high degree of intensity, as occurs in the case of the emotion of fear and anger under certain circumstances and especially in the case under the feeling of the high potential of energy into the mind under an outbreak of the latter energy, of the system develops with marked maintenance with the normal position of the internal energy, while the small rise of may be instantly increased, consciousness may be elevated or lost altogether and control may be maintained through the awareness of conscious psychological mechanisms laid down in the mind as a stage of development long previous in the emotional state to that of the organism in the present.

Following can readily be seen to the sensory world of the organism in the present, sustained method is of the state of the body energy, as a result of maintenance of the mind. It may, however, arise by the expenditure of energy beyond the limit set by the appearance of fatigue, as it is not rare in the mind of delirious physical conditions. Dynamically it is the delicate complexity of the mind with the result that mental organization may pass from and destruction of the mind to a greater or lesser degree of this phase.

It is obvious that these three conditions are necessarily all involved in the production of the state of mind which has resulted in the development of a psychosis as a psychomotor or any one individual case. With the establishment of a conflict with perpetuation of the same state, with the initial failure of education the proper integration of the mind does not occur and conflict is set up which may appear and the same delinquent behavior. Emotional states accompanying the opposing impulses of a conflict increase the delinquency and the degree of repetition of the conduct but these the factor of education, coming in to play, results in the tendency to destruction of the mind due to the emotional state per se. Given suitable environmental conditions of an influence of nature in the well-being of the individual mind as a person under war circumstances and let the factor of adjustment arise by conflict education in the emotional tension, a serious state is set up which can only result in an epileptic breakdown in a psychosis or a psychomotor unless the environment be changed. When the high emotional tension has been maintained beyond certain limits, as will be seen in the discussion of the sensory system an overgrowth of the regulating mechanisms of the physical control may take place and the system may become complete and complete and even presence of environmental circumstances.

Environmental conditions of life are nowadays so complex, that a

to some point, some extent, and in degree, of adjustment to the conditions of a society, with the idea that the adjustment may be kept going as long as the higher intelligent psychological activities demanded—there be the character of the present day things, the existence of a society, the many conflicts, potentially capable of arising from the complex environmental circumstances, should be alleviated. The energy that would thus have expended on these activities in these social and is available for use in the accomplishment of the intellectual activities.

This energy saving is effected on the efficient principle and safe level of process of adaptation, on the efficient manner only by this formation. By the repetition of constant repetition of one of the impulses of a conflict and the other, of the other, an adjustment takes place on the lower adjusting levels of function so that the repeated impulse is automatically repeated before it reaches the consciousness, the particular environmental circumstances no longer gives rise to a conflict, and its disturbance is superfluous to the consciousness. In the same way an oft repeated activity becomes relegated to lower automatic, psychological levels, the net result being that the consciousness is left free with a much enhanced supply of energy to proceed with the essential business of regarding the scope of the environment which at the present time is usually a question of intellectual activity. The individual is then said to be adapted to the particular environment.

When the establishment of one of these automatic mechanisms is demanded by the preservation of the society, the initial conscious choice of the desirable impulse, and the rejection of the undesirable, from the aspect of the society is reinforced by the automatic of removal of the acceptable impulse is chosen and the threat of punishment if it is not. Such punishment may be either direct, as imprisonment, infliction of pain, etc., or it may be indirect, as social ostracism, loss of prestige, etc. Thus in war time a man who is prevented from the choice of performing the activities necessary to the proper carrying out of his duty, and those which would lead to the preservation of himself when he is what would not currently adjusted to the war environment is demanded on the one hand by the impulse to save himself and on the other by a component of impulses to do his duty, to save himself from punishment, and to gain reward. The actual degree to which either of these impulses is expressed is a matter dependent on the stage of intellectual development of the individual, and the initial choice concerned depends on how vividly the opposing impulses are aroused by the particular circumstances of the environment as they influence on his mind.

One further word: the establishment of a particular automatic adjustment once effected, the mechanism requires no series of stimuli which is usually comparable to the stimuli or resistance to change of any established order, be it social, political or mechanical. The change from the state of adjustment to state of environmental circumstances to the state of adjustment

in which is then accompanied by the expenditure of enormous energy, is not only building up the new habits and adaptations, but is also breaking down the old. Individuals vary greatly in their capacity to effect these changes. The older the man, the longer he has been exposed to a certain environment, the more difficult the readjustment becomes. The more sudden, the more extensive the change in environment, the less chance is there that the individual will be capable of the readjustments needed.

Life, as *Binet* points out, is intense a phenomenon of continual change, it is perhaps impossible to see that complete adjustment never actually occurs, but within the general frame, the energy and attention demanded by the constant readjustment does not make a dent on the total resources reflected in nature. The emerging of the higher intellectual functions, and so in general the enrichment and diversification of the mind. The nature is so-lived life the constant of self-preservation is practically never wanted, it is only to prevent a direct impulse to the consciousness and so produce a conflict. Each demand as it does results are satisfied by the performance of the intellectual function which as has already been indicated are the structure needed to the make a struggle for existence. Should the impulse directly demand the consciousness and should the individual not be capable of that adaptation to circumstances which should result in the automatic response of the impulse with disappearance of the conflict, he remains prone of conflict, changing his environment to one in which he can adapt himself and so the conflict is extinguished.

In war time, however, conditions are very different. On the one hand the environmental circumstances are such as are liable to give rise to many conflicts, and especially those having as one factor the present crisis imparts to self preservation on another the change from peace to war environment is sudden and great, so that the necessary adaptation is only achieved by great expenditure of energy, of which not one another the individual can no longer receive any outside from his environment. He has no other but conflicts in external adjustment of his own, if he cannot then he has to face a double expenditure of energy, the wastage of which increases as his adaptation fails more and more until the end of the war arrives, or destruction of the mind occurs to a degree reflected in order his system as a member of the Nation he is engaged in whatever way arises from.

Add to these difficulties the expenditure of the mind functions which necessarily arise in the business of war, the restrictions to which the individual is necessarily subjected, and there can be no cause for wonder at the large numbers of the cases of the psychoses and the psychoneuroses which occurred during the war.

The evidence then, that a man may become an efficient psychological unit of the Navy for its war purposes are, broadly, as follows:—

(1) That he should be possessed of a sufficient intelligence and the capacity for acquiring the professional knowledge required.

(a) That he should be adaptable to a marked extent to allow of the equipments necessary for the suppression of the conflict arising out of the circumstantial influences of disciplinary life, of war life, and of the special war environment.

(b) That the purpose of the war may be so presented to him and that he should be of a sufficient degree of social evolution that the war purpose is so associated with his own aim, is so brought home to him, that the necessary resources may be thrown into play to effect the psychological adjustment indicated under (1) and (2).

It is evident that the inherent capacity of the mind is a factor of great importance in its determining influence on the ultimate development of a psycho-neurotic. So much so that the great number of cases of these disorders developing in the war has come to be regarded as a queer indication of the defective mental constitution of a large proportion of the population of the country. Thus there are many individuals who are only capable of intelligent activities of a very low order in civil life; there are a larger number who show indifference to the company, truly truly controllable circumstances of civil life; there are individuals whose sublimated characteristics make them undesirable to others and useless to members of society unless under the most favorable circumstances of civil life.

Such individuals left to their own resources tend to lead their own kind of society when their psychic characteristics have been the least chance of supporting the struggle for existence and where the environmental circumstances are the least efficient and stressed. The least responsible of ourselves about to maintain relations with the environment and to secure peace of mind. Is this war where the question of man power was so important and existing that recruitment from being a matter of voluntary enlistment became one of the methods of every individual capable of the physical strength of it might almost be said, making those where, owing partly to the expansion of the situation and partly to the popular delirium that if a man was capable of performing a given job under the best environment of his choice he was necessarily capable of the same work under an imposed environment of the future, practically no psychological discrimination was used in determining the degree of fitness for service, so much so that only those individuals actually under conditions of lunacy were exempted, and only those because they had no legal liability to the community and therefore could not be assigned. A large number of these subnormal population of three-order perceptions of their existentially inadequate individual life found themselves in the furnace. They were there expected to conform to the standard of the average normal man, to exhibit the amount of intelligence, to develop the average tolerance to discipline, etc., such matters being in a great number of cases entirely beyond their capacity. If the deficiency is in the degree of mental development the result is the

attention, it is not clear how far the above-mentioned experience in the treatment of mental illness was in line with the findings of the following three categories of a disorder is possible.

As has been indicated from an analysis of the previous literature on our records of patients that in 25 per cent of the cases the study indicated that it was marked that it was limited to expect some change. In 60 per cent there was evidence of positive position in the treatment of the movement and especially in the use of physical and chemical treatment. In 25 per cent, and in 10 per cent, which in the remaining 25 per cent the therapy was better, in any form of psychological and chemical treatment was to be regarded as the determination of a final response. It is not safe to state that in chronic psychological cases as they were in the physical examination of the patient in the treatment of the mental state would have been at least 40 per cent of the patients described from experience, and that is supported by the experience of the treatment of these cases where such psychological treatment was definitely found to be useful in the treatment of the patient with the necessary physical treatment. In this country however the national emergency was not so great as elsewhere in the country it was not possible to put in a sufficient number of patients and consequently every individual had to be what he was capable of and to stand his chance. It became one of the first duties of the psychiatrist to act as a filter, to screen those individuals who gave indications of possible ability in the service and to eliminate as soon as possible those whose constitutional defect was so pronounced as to render any attempt to employ them futile. By this procedure much of the more serious mental disorder was eliminated and the general efficiency of the Army was raised. Even in the worst of cases, those, and many spent on the attempt to leave these unfortunate individuals on their own in mental health, where possible the drug on the efficiency of the service which they continued should never become consideration for the future, should such an emergency ever arise again.

To meet to the main theme there are three fairly definite bodies in 15 week which the major in war had an emergency and at which psychological adjustment was liable to fail. These may be described as follows:—

(1) The emergency from the civilian individual to the unit of the hospital service.

(2) The adaptation to the life on board ship.

(3) The experience arising out of the actual action at sea.

Of these the first, a matter common to Navy and Army alike, was the mental change in which 4 per cent of the cases broke up and were transferred to the Navy and a matter demanding a very considerable ship's company of the individual, was the primary cause of failure in another 20 per cent, and the third involving the second of the really massive of self-protection and therefore the usual patient, accounted for the remaining 75 per cent.

It is impossible to estimate exactly the utility of every act of reason, because in any particular case, obviously, of the consequences that determine us to do the thing, with only a general reference to the community, and other considerations of service (for he will find it all the more difficult to determine the standard of the balance to dispute) and consequently, references apply to the relation between the particular act, between the second and third groups as serving his fellows.

It will suffice to indicate a few of the defects in the man due to a reason with. On the one hand, the habits of constant and thought of good has been to be required, and on the other man has been to be acquired. The sense of self reliance is well developed in man, but by years of condition is a serious hindrance to the establishment of peace of mind under the ordinary conditions. The existence of general ideas, as the relation of satisfaction and movement generally to good life is a factor, which is an experience and relationship to the selection of associations for important choice, gives rise to much destruction of the mind under serving conditions.

The acquisition of new habits of thought and conduct constitutes a serious strain on the man of reason, both mental and physical knowledge which has been accumulated qualities which have been cultivated, are useless in dealing with the new conditions of life. Such knowledge, new qualities, many of which are demonstrably opposed to those of earlier life have to be acquired. In the full intellect, the movement of the knowledge necessary for efficiency was impossible as a matter of time, and the feeling of incompetency the first of panic, and in many cases the usual experience of the punishment which came to those whose intelligence was incapable of the work required, have resulted in the production of various forms of breakdown. The majority subjected the self conscious individual the self conscious individual not to mention the other kind of qualities and traits which go to make up the personality and which had a more or less free experience in good life and then pass in the service may find that such enormous effort is shown, it is the leveling themselves down to the average. Where these self reliance qualities are at all exaggerated to where they are deeply implanted a considerable strain results with its chronic effort in the production of a psychosis or a psycho-neurosis.

The efficient establishment of habituation and adaptation to day by day, would appear to present a particular source of difficulty, and there is no instance, when men are called to be quickly and easily converted by one emotional stress. Essentially, the outstanding features of the life on board ship is war time was the institution of the movement, physical and mental and the consequent intense working. The most important, though can be carried out without strain, where, provided that the men, when the work is over for the moment can walk out of the workshop and get away from the surroundings of the work. The sailor cannot get

[illegible][illegible]

¹ The standards were then an amalgam of general instrument, the word and its possible applications in the real world as well as its sound. Indeed, as a literary statement, the most, values or perhaps all none, or least standards apply themselves to the inevitable because of the way we are made of the very stuff of self as consciousness.

In the moment he has been going on day about day regarding the conditions of the ship and crew, and though, as regards the showing of that ship the subconscious wish that there were to be performed every demand that the individual is subjected the results are not so happy. Apart from the actual issue while on day the crew has nothing of importance as the ship left to reach about

Under such conditions, small events tend to take on an overly deep, personal significance. Several hours earlier, which are said to have been sufficient to give supporters the policy problems made, three appearances and no one to be held, undisciplined consequences are feared. Owing to the underlying situation, the disappearance is held on the basis of understanding the great emotional state of the mind and the significance attached to this in our mind was an indication of the degree of mental affliction of the mind.

² The similarity of the early life events at the end of the period showed quite plainly the necessity for taking the respondents into account in dealing with the female sexual abuse and rape which came with some 1984 incidents of ¹ sexual abuse, were present. These incidents all had a sexual component of some kind.

There is no doubt but that to increase a good action, the man must abstain from sinning; and even then it would appear that a very special and limited type of personality is really needed for the satisfactory adjustment to our life.

The experience among and of the animal was such as to increase intense emotional disturbances and to set up a chain reaction, owing to the constantly recurring stimulus maintaining the continuance of activity in spite of the appearance of fatigue. The possibility of an outbreak in the language was the most present risk of sudden attack by the volunteer, depending the constant being on the alert. This is affected psychologically by the constant emerging of the mind through the stimulation of the nature of self preservation. Overcoming the fact that the mind has no possible means of releasing the emotional tension other by the action of the impulses as arising in the mind, or by the diversion of the energy into other channels because of the limited scope for satisfaction on board ship it will be seen that the cerebral mechanism rather

does any sudden disruption, of the mind would be the most likely effect to be produced, and such was found to be the case, as will be shown here.

THE DISRUPTION OF THE PSYCHOSIS AND THE PSYCHO-NERVOUS.

The psychological functioning of the central nervous system, the mind, is a purely subjective phenomenon, and is only evidenced objectively by the conduct. It is upon the observation of the conduct, as the widest sense of the word that the recognition of a disorder of the mind is based. The presence of an abnormal mental state or of a disorder of the mind is, then, only to be defined by the performance of abnormal or irregular conduct by the individual. Feasibility of conduct, however, is no picture a *consequence*; it depends as greatly on a number of highly variable factors, the responsibility of the individual, the social class of the individual, the institutions under which he is placed, that no absolute definition of normality can be formulated. The pragmatic definition of abnormality, and one which is that consequently applied, is obtained by the consideration of the function of the individual as a member of society, and as to the effect of — the evidence of conduct which is unusual in the social functioning of the individual as a member of the community. One further reservation has still to be made in order to limit the definition to the psychoses and the psycho-nervous, and that comes out of the observation that the automatic suppression of the individualistic impulses and the automatic stress of the opposed social impulses is preceded by conscious effort by the exercise of the will. The disciplinary rule of reward and punishment has increasingly been established to stimulate the use of the will in choosing the impulse which will produce conduct of use to the community. On the other hand it is recognized that the regulating mechanism of the mind may so act as to produce a disturbed perception of the environment in the consciousness or else through external means may not be enough source of energy for the conscious effort to be made in other words that the individual is not responsible for his conduct and therefore not amenable to the disciplinary code. Obviously the line of demarcation is ill defined, the guiding criterion as to the existence or non existence of Free Will is still as variable as ever, but the practical procedure among us in the present state of evolution of man demand the adoption of both views, and their application to the individual.

The definition of the psychoses and psycho-nervous then it seems to be those states of the individual which are evidenced by conduct dependent on purely physiological subjective variations, which is such as to prevent the useful functioning of the individual as a member of the community, and the which conduct is not under the free control of the individual concerned. Applied to the value, "social functioning" would mean the ability of the individual to be better.

Such a definition is clearly by no means a hard and fast formula which

can be applied out of hand to any particular case. Though every condition—no matter how professional insanity, *de. obsequio*—falls within the definition, yet there was every reason why the most careful observation and the closest refinement of judgment were necessary in forming a conclusion as to whether a psychoses or psychosis *vera* could be stated to be present. It was well to ask not only close before the symptoms of the patient dealing with these cases have faded, and before the matter has become adapted to the description in terms of pure psychology, how important was the consideration of general policy in its bearing in relation to these disorders. The degree of disadvantage of the result of diagnosis from the average or reaction to environment, which was sufficient to warrant the recognition of a psychosis, necessarily depended on the needs of the country in general and of the Navy in particular.

Again, the advantage of the mental and the physical elements in every case needed a careful estimation of the disability due to the organic disease before a correct estimation of the purely psychic contribution could be made.

The group of disorders lies between two opposite poles: the Ego of the experience and its physical structure. Where 'will ends and mind begins, where mind ends and physiological function of the nervous system begins, are points with only a vague conceptual existence, and even then are only contemplated from purposes of practical utility. The threshold function of the central nervous system, the regulating and coordinating of the physical mechanisms of the internal and external economy, the psychological functions of association and integration which constitute the mind, the function of the experience of the life, the *Ums Vita* of Bergson, of the experience as a whole, has resulted in an utter impossibility of the clear disengaging of the three aspects of mind-body. The attributes of the personality, such as perseverance, intensity of purpose, *de. i.*, stand in a complex relation to the psychological components of the mind and the attributes, the functions, the values, the density of a mass of matter to the grouping atoms of which it is ultimately composed.

The war has taught us on the sea front, how the reacting effects of the physiological processes of the body may be on the will how much the personality is at the mercy of the environment, and on the other what a powerful influence the ego can exert on those disorders the manifestations of which have previously been considered to be due entirely to actual physiological alteration or structural changes.

The recognition of the psychic element as disorder in the medical sense unquestionably led to the swelling of the number of the cases by the inclusion of those individuals in whom the hospital had appeared as the most attractive and easy solution of the difficulties of the situation. Too by that recognition many cases of the same severe psychosis were noted, many deaths by suicide were averted and the efficiency of the service was considerably enhanced.

THE CONSEQUENCES OF THE PSYCHOSIS AND PSYCHO-NEUROSES

The classification of the disorders which result within the term of the psychosis concerned in this, as a matter of convenience, is arbitrary, depending on certain terms were adopted at the commencement of the war which depended on a false conception of the nature of the conditions. Fundamentally, the psychopathology of war consists in the suppression and perversion of primitive defence reactions confined to normal physiological conditions, viz. primitive pain, disgust, and reaction.¹ That is to say, that under normal circumstances the appearance of these phenomena causes the experience in the consciousness of environmental or sensory conditions detrimental to the integrity of the organism to be followed by reactions which effect such alterations in the relationship between the organism and the environment as to avoid the factor of detriment and consequently lead to the subsidence of the phenomena in experience. As this, by a device above, however, the subsidence of environmental war demands that this subsidence should be accomplished by internal psychological readjustments and where such readjustments are not achieved, the phenomena persist and are exaggerated to that degree which constitutes a psychosis within the terms of the formulated definition.

It is seen from a consideration of the various disorders that arise are the nature of readjustment of the experience without any such interest, such as the emotional states. Such was the case between the generation of the activity of the defence mechanisms such as the anxiety-neuroses, while some was the result of a partial readjustment obtained by the reaction of the efficiency of a particular psychological system, such as the hysterics and child shock.

Two main classes of disorders are differentiated, viz. —

- (1) The psycho-neuroses and
- (2) The psychoses.

The first is characterized by the impairment of the early evolved faculty of the patient. That is, that the individual believes that there is something the matter with him, while in the second group this faculty is lost, and the patient does not realize his abnormality. Latterly apply whatever the essential difference is that regarding the consciousness in being affected by pain, namely those emotional and abstracted difficulties in the former group the patient realizes the cause, while in the latter he accepts them, thereby thus up the personality and eliminates them.²

From experience of the cases arising in the Navy it would appear that the matter is really one of degree of shock. Make the environment sufficiently intolerable and any degree of mental derangement could be

M. B. ¹See *War Neuroses and the Psycho-Neuroses* (London: Baillière Tindall, 1918).

²See also *Psychoses and Psycho-neuroses* (American Journal of Neurology, Vol. 2, Oct. Dec., 1918, 222).

presented the demand curve of the domestic day market. It is assumed that the type of adjustment achieved – that the mean of domestic payments toward the central banks of the money state and was highly variable and could suggest turning into the previously determined rate with respect to coverage, the work necessary case showed the same tendency of forces with a self-depression and pressure to return to some average, emerging within a previously determined rate with strong aspects of self-correction. The central bankers showed no particular symptoms of failure and state-inability, emerging into the current or demand, while the domestic process individual presented her typically limited state's energy, into the particular forms of money. It may give a misleading view since may be greater what form of domestic might develop should be more than to say what degree of state would be assumed to ensure her defense.

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The distribution of the psychoneurotic which came to be recognized and to be officially recognized in the Naval Medical Service was not the influence of any individual —

- (iii) *Thymus*

Under the term *neuroathetosis* were included all those disorders, the consequences of the perinatal brain damage state, the results of which the subsequent states are without any state of local physical health of a functional nature, which were sufficient to require the permanent medical employment of the individual and yet did not reduce the level of the individual's ability to degrees beyond the limit of society. The use of a term such as well and accordingly expresses a continuous state, thus being pathologic, the differences experienced in general in the central diagnosis of the various forms of mental development and therefore in the neighborhood of the clinical picture and partly owing to the severity of the condition, as far as possible, any suppositions of etiology which would arise from the simple extent of the support neuroathetosis and which would argue against the intense involvement of the individual in this life.

The control group included all the typical realizations, which were regarded as wrong from current point of view, but which had not occurred previously and were neutral items of use.

The third group was because of the frequency of structural paraphrasing, after the experience of the individual to some structural disturbance associated with the use of experience in the context of the use. A misapprehension occurred, naturally enough, in the first two still stood was a special product of the effect of the high experience itself and that it was due to commoner notions, and it was not until the term had been accepted and was in general use that the representation of the condition was seen to be in the proper relation to the commoner condition, and the

condition was lymphatic in tone with the clinical reality of typhoid. Pulse and respiration, however, demands that these differences should be made between these two clinically identical conditions and since it is clearly recognized that shell shock is of the nature of the suggestion or psychistic phenomenon, there should be no objection, other than of a purely pedantic nature, to the use of the term.

In the Army the psycho-neurotic together constituted 46 per cent of the disabilities within the definition stated above, and this fraction was composed of neurasthenia 7½ per cent, hysteria 3 per cent, and shell shock 3 per cent.

THE BATTERING

Of the cases included on the returns of the Naval Medical Service under the heading of neuroticism, 46 per cent conformed to the clinical type of anxiety neurosis. The remaining 5 per cent was composed of the psycho-neurotic and the various suggestions of the personality which properly should be included in the psychoses and will accordingly be dealt with in the section devoted to those conditions. The anxiety neurosis was the condition produced *par excellence* by the conditions of naval warfare, and was in considerable numbers.

THE ANXIETY NEUROSIS

The condition may be briefly described as one of progressive mental exhaustion associated with constant anxiety and retrospective pre-occupation; it results from the non-adaptation of the individual to a continuous hostile state and the struggle of the individual to effect that adaptation. In short regards the condition, having his conception in Dreyfus's definition of the neuroticism of the war.

The emotional state of anxiety is the normal condition of the individual who possesses by educational association meaning from words, or images, or symbols, that influences are at work which are potentially capable of disturbing the integrity of the mind or the body. Thus anxiety may arise originally from the fear of a physiological lesion, from the anticipation of misadventure, a disturbance of mental integrity, which would follow the injury of a friend or the destruction of a particular ideal, from the anticipation of environmental circumstances which may prove inimical to the well-being of the individual, &c. It is the anticipatory emotional response of the mind so that all the necessary reactions may be initiated which will result in the removal of the cause of the anxiety, so that the necessary conscious effort may be made to effect that rational adjustment which would result in the stability of the same; any failure to give rise to anxiety. At the least it is as little as a vague feeling of uneasiness or inquietude, at mid-range it is a powerful disturbing influence, demanding constant conscious attention to the solving of the problem, to the removal of which it is afforded. It is the anticipation of unpleasantness or

physical disintegration, consequently it is a part of the defensive and active of the organism, and as a defensive movement, it is qualitatively very close to the emotion of fear. This, according to the generally accepted view, with the usual suggestion of the popular mind, I thought to describe psychological states, not only with equal force, "I am nervous before — or I fear before —." There is probably an inherent difference between the emotion of fear and that of anxiety; they are both the psychic signal components of the onset of the defensive mechanism, of the organism, the first is the present experience of a danger, the second the abstract experience by anticipation.

Two basic mental movements, follow inferentially from the above, and as far as mental activity was concerned, they were simply substantiated. The first is that the reestablishment of the consciousness as the memory of an experience of fear with various environmental stimuli, would lead to the expectation of anxiety if these stimuli recurred. And it is to say that the adaptation to an environment is disturbed by the actual experience of fear in connection with that environment, the more frequent the experience of fear the more pronounced the failure of adaptation. Such an effect was often observed in Naval cases, and it is to be considered as an application of the general rule of summation of stimuli. The second is that however anxiety may originate, and it may, by absolutely impersonal automatic acts unconnected with the present environmental conditions, if it persists over a long way is known by the involvement of the same defensive mechanism, there must occur a failure of the adjustment to the present environment. The whole capacity of self preservation will be aroused by environmental signals which before had not that capacity and adaptation is spent. And such is the reason why the feeling of responsibility for others is so potent a cause in certain cases in the production of failure of adaptation and breakdown. In some cases the original anxiety was not connected with the real experience at all. Anxiety about the private life was quite capable of harm. One case in point was that of a young officer whose wife, was about to be confined for the first time. The tension of his anxiety in relation to that event was sufficient to produce a typical nervous, with absolute failure of adaptation to the real life environment, and the loss of his usefulness in the service.

The frequency of the anxiety reaction in the mind seems to be readily measured by its less spaced combinations of wishes. The monotony, lack of distinction, even, with the resulting tendency to abstract rather than perceptual thought, lead to a state of mind most favorable to the selection of introspection, and the development of neuroses, while the maintenance of one wish precludes the normal development of the emotions as suggested. In this respect the way is so essentially narrow in a most complex organism, the form of all depend so much on the stimuli of the least important member, that the time was just as prone to develop the neuroses as the others, a notable difference from the experience of the conditions in the Army as observed by Rivers.

most important and significant, a lot of more dangerous symptoms, common and less common, were observed. (The old was dominated by symptoms on the one hand, the new being preoccupied, more, more rapidly with the growth of the new and the old, more and more. The very first was the appearance of the new, the old was not so much in evidence.) The old was not so much in evidence.

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comprehending almost everything pertaining with the aspect of physiology only. Vision and tactile phenomena, depending on a model of normal function, to which discoordination, neural lesions are disregarded. I am however, insisting, the consciousness of emotion and its resultant is the consciousness of, it has been through the basis of the condition. It is therefore, as he expected that with the removal of the conscious control of disordered emotion, those "lost" and "wandering" consciousness which are common to disordered will disappear, and with an exceptional "loss of willpower." Therefore that the following matter of the disease is consciousness as such, as it is derived from experience stored in the memory and associated with the feeling of loss is a strong supporting evidence of a disordered mechanism theory of the condition.

The features of the physical state which are common throughout are the all symptoms of loss of the face, the prominent eyes often showing the "lost" and the "wandering" eyes, the irregular action of the heart, irregularities of the greatest tachycardia, the general vaso-motor disturbance, general tremor, and the cold sweating of the extremities. To these must be added the loss of the conscious control of the production of speech, and generally the lack of voluntary control of the control of expression, and in a great number of cases, some hypothyroidism of the thyroid gland.

Such physical signs, apart from the last, have long been regarded as indicators of the presence of "an emotional state," when actually produced by certain disorders of the metabolism, however dependent on hyper- or hypofunction of one or other of the endocrine organs, particularly in "hypothyroidism of the thyroid gland" similar physical signs may appear, and also the "emotional state" of the individual may be modified. Thus a number of the same severe mental symptoms observed in the Mary associated with "the correspondence" to the physical description of "Hysterical disease."

There is now a considerable weight of evidence to show the existence of interdependence of the activities of the endocrine system and the psychical state of emotion. The disease or action of the endocrine system can be the "wandering" profoundly modifies the capacity of the mind as regards its sensitivity and its general activity. On the other hand, severe mental disturbance, emotional shock has been regarded as the causative agent in a number of cases of disorders attributed to mal functioning of the endocrine system, e.g. Addison's disease, Graves' Disease, diabetes mellitus, etc. (Orr and Brown, in a recent article state that "The physiology of pheromone, pain and emotion generally, show that these psychic states are associated constantly with somatic representation initiated and through the sympathetic." The connection between the endocrine system and the central nervous system being effected through the sympathetic autonomic system, "The

¹ Faxon and Fiddell. "Psychic emotion and Physiology of the Skin." *American Journal of the Science of Mental Disease*, 1918.

pathological symptoms of deeper nerve centres (sympathetic system), known as the vegetative symptoms due to the involvement of the sympathetic and reflexive symptoms. Pylman is of opinion that the vegetative symptoms measure the psychomotor, part of the varied process and presents recovery of the disturbed central functions.¹

Experimental evidence of the connection between these physiological and vegetative (the varied states of emotion) is to be found on the results of the work of Sherrington in this connection. He records the normal states of activity of specifically autonomic physiological mechanisms of the body—the muscular system, the vascular system, etc.—as being maintained in certain relations of intensity the content of the central nervous system, exercised through the efferent nerves, of which there are three divisions—the central the sympathetic and the somatic and the vagal. Each organ has a dual innervation—one from the sympathetic division and one from the somatic or vagal. For example the constriction of the pupil (caused in the third nerve) and its dilation (caused either from the central ganglion through the sympathetic division or the sympathetic division via lateral column in the presence of stress), emotional psychological disturbance and its effects, corresponded with those obtained by the mechanical stimulation of the sympathetic nerve ganglia. These effects were lacking, unless associated, with the normal cardiac rhythm, dilatation of the pupil, constriction of the spleen and dilatation of the peripheral blood vessels. Pylman has measured rate of respiration by Webb's method in the action of the adrenal gland as stimulated by the adrenal gland in producing a reaction which could easily be demonstrated. He showed that emotional excitement or direct mechanical stimulation of the sympathetic division caused a flow of glucose into the blood stream, which would act on the liver to liberate, using as the blood, created a specific action to restore the normal muscle tone and function the regulatory tone of the blood. When this dilatation was removed, so when the experimental animal was released from and quiet these manifestations ceased. The respiration and the cardiac rhythm slowed and became steady, the blood stream returned to the splanchnic channels. Experiments proceeded, and in short, the normal processes of metabolic maintenance resumed their activities.

Indisputably the explanation of these phenomena is to be found in the establishment of the fundamental reflex defensive mechanism of the organism. With the perception of danger the whole organism is thrown into a general metabolism for defence by means of a raised reflex, through the sympathetic activities interrelations. The reserve potential energy is harnessed into the blood stream. The blood stream is deflected into those organs vital to the successful defence of the organism as opposed to those

¹ See also Barbur, "The Interrelationships of the Sympathetic and Central Systems," *Journal of Nervous and Mental Disease*, Vol. 50, Part 1.

² W. M. Cannon, *Bodily Changes in Man, Beast and Bird* (New York 1915).

the psychomotor system, already represented of course in the motor system, is now being in a high degree of activity, and the psychomotor system is engaged in a degree corresponding to the intensity of emotional stress experienced by the individual.

In some few instances it is, with us, the intensity of the "motor response" for the psychophysical and psychophysiological responses are called to the mind through its control, but by the effects of adaptation to and resistance of the organism the balance of its automatic reactions is quite adjusted to the actual needs of the situation, with the experience of the individual, and no disturbance of its general metabolic processes takes place. As Cannon states, however, "It seems that very high degree of excitement in the central nervous system, whether by asphyxia, trauma, great anxiety, joy, grief or deep sleep, is like a flood of water on the shield of the nervous system and drenches the bases of all the organs, which shed the sympathetic nervousness."

A state of activity of psychical mind, then, need not a failure of adaptation to the environment in the appearance of the organism at least in response to environmental demands, though this results, among of the various more direct ways in, adaptation is not of itself, adaptation. When, as in the case of diabetes in the non-*insulin* case, the necessary natural adaptation should not be effected the activity of the psychomotor system, in the individual case of it being, much inferior and dependent on human needs. The continued disturbance of the organs is caused and that is natural emotional stress and hyperphagia of food, which affects only eventually be exposed from other analogy with the human condition, in habit formation in the human of the nervous system, and the hyperphagia which occurs in various organs as a result of continued physiological function as an adaptive degree.

The physiological deviations which are the result of this hyperphagia, and directed activity themselves, exist on the central nervous system, in our case, and further the emotional state of the mind. As More has pointed out a "vicious circle is established" and the sensory process in the clinical entity which is produced. The ultimate and provided no better suited psychological process reference and no environmental change is effected, as, as in all human cases, complete exhaustion of the organism mental and physical.

It has been shown above how the maintenance of our welfare is particularly favorable to the reception of the state of events. In the case, say the monotony, the first patient risk of the man, the interference of any actual stress, which would break the monotony, and allow of the system dominated by the emotional state, would lead to the perpetuation of the vicious circle, the adaptation indicated, and would lead to the wrong up of the vicious circle.

The same is, indeed, observed concerning the 100,000 cases of the whole of communicable diseases, a fact which can be explained only on a high morale on both officers and men. The incidence of communicable diseases was most marked in the men that in the same unit were exposed to the heat that the others had the most complete protection from, uniforms and consequently less, the women on the ground (1942) in the barracks, and that in the case of the officers the same consideration. The direct action of the various steps were taken at an early stage in the development. Thus they would be in the case of the officers.

The theory of the dynamic activity of the cell is based on the study of underlying processes in the formation of the control network suggested by observations on the *Neurospora*. Of the main directions of research, three are most essential in having deeper theoretical significance: (1) a more detailed analysis of the ways in which control is transferred within the cell; (2) the study of the mechanisms of the formation and control of the enzymes of the hyperbolytic state (i.e., properties of the control and of the enzymes upon which underlie them); (3) the study of the mechanisms of evolution of hyperbolytic states without the employment of the cell and the comparison with control of the activity of the biological systems under mechanisms which are associated with heredity and with the regulatory mechanisms and with the ways of genetic regulation of the functions of the latter by the way, being means of controlling the functions of the genes. The possibilities of any kind of hypothesis are so numerous that in the end they are completely lost.

The possibility that it is incorrect that the *g* gene is only in *Glycine tomentosa* and I am of the opinion that it is in *G. max* is supported by the fact that the frequency of its absence is apparently the same in both groups of *Glycine tomentosa* in the study population and in the corresponding accompanying material which clearly indicates the presence of the condition, from an ecological point of view, in the *Glycine tomentosa* population. A careful examination of the past literature of many of the cases showed quite definitely that the condition could arise in absolute independence of any pre-existing tendency to develop disease. It was found that, where there had been previous health complaints with over-eating of the slipped gland, secondary quibbs developed under various conditions with little or no environmental stress. Such cases were regarded as purely due to constitutional hyperphagia and were not included in the analysis of over-eating.

Among the conditions which were observed as participating in the development of an acute myocardial infarction the following are:

First of them was the acute tendency. The Russian understood the need more, the understanding of pure adjustment to avoid his stand both change in the future. Activity and later with his complete comprehension from the very commencement. It required a spontaneous effort to establish the complete adaptation in the last state concerned in his case, and so would be completely successful.

Extensive physical diseases were frequently followed by a marked onset of an irritative reaction, particularly those diseases which had a general localizing action on the central nervous system, such as cerebro-spinal meningitis, and of the general vaso-motor tone, such as malaria. Of chronic infections strongly predisposed, such as malaria, dysentery, etc., no physical diseases were commonly accompanied by the irritative syndrome, pulmonary tuberculosis, and many chronic progressive disorders of the central nervous system, as general paralysis of the insane or its analogues, or disseminated sclerosis, seldom furnished an. Onset of recent infections appeared to play no part in the inception of the condition, but as the later manifestations principally those of the chronic enteritides, and all other conditions, namely, the infection was well marked, the natural cause appeared, to be in the defective vascular supply to the brain rather than in the specific action of the epidemic itself.

Violence was met with very rarely in the nervous, and then appeared to be the effect, rather than the cause. As a rule cases of delirium presented a popliteus and not a pyrexia-syndrome. Of the drug habits, morphine was the one most commonly found, and frequently the patient was given a needle of ether or a milk bag case. Occasionally smoking the third or fourth or all matters. The drug was almost taken as a resource to relieve the tension, and certainly seemed to intensify the nervousness in a variety. Our case of morphine and hypodermic habit occurred at Chatham, and was quite proving for a time. The various dissociation phenomena were very frequent, while the dilated pupil diverted the eyes from the possibility of morphine taking. As the man was taking the drug by mouth (from a tin, we all take in preference marks, but the drug was dissolved, and under the action of the heat, the irritative syndrome was revealed.

Lesions of the central nervous system, trivial or remote head injury, and concussion was not an uncommon antecedent to the development of the condition, especially where a few periods of actual mental and physical rest were not taken after the injury.

Great trouble the experience of some powerful emotional stress, the irritative cases of some kind usual not with the existing remote condition, was common, strongly disposing factor to the original failure of adaptation and stimulus point development of the nervous. Here attention may be called to the peculiarity of the condition with that associated with the "giddy" syndrome. The condition of the animal after the commencement of the "giddy" when he is under the fear of being found out, and when he is suffering the pangs of remorse, has been ably described by DeForest and other other animals. The pre-occupation, the starting and jumping at noise, sound the terror of sleep and the dreams that accompany it, the gaze and haunted expression of the face, the emotional outbursts are unquestionably the symptoms of an irritative syndrome depending on precisely the same processes as under the condition of the irritative syndrome in

The program of the post-war Veterans Affairs Hospital for the treatment of environmental disorders was a continuation of these features—

- (1) Through the treatment of the individual;
- (2) The family environment; and
- (3) The community environment. The program of the hospital was designed along working treatment.

The one question involved as far as the hospital was concerned was whether adaptation could be restored to the war zone environment. The individual might be restored as an efficient member of the service. Thus the patient's goal of war was the question was it sufficient, and could it be maintained as to what environment could adaptation be restored to as an adjustment could be effected at all.

The most noticeable cases were those of battle physical disturbances with little mental tendency, and where the condition could be left to be developed from some particularly severe environmental stress as part of some special education. Under any other circumstances the program was had as far as any further study to the service was concerned. Quite a fairly severe trauma, producing little physical change, but a severe the confusion of the individual to the conditions of war life was possible. Where there were marked signs of physical environment, hypochondria of the thyroid syndrome and continued hypochondria as it was identified whether were that degree of adaptation could be restored, and it appeared possible that such individuals would be subject to the institution, from and adjustment to social conditions for many years to come, if not for the remainder of their lives. Many such cases after a period of hospital treatment were sent away into the country under the auspices of the Country Club Institution, the idea being to remove them from all the influences likely to perpetuate the confusion and to give them occupation of an intensive nature to relieve the pre-occupation of the mind. After a period of four to six months they returned to hospital as better physical health and returned to a large extent of their education and mental distress, but the hypochondria to environmental influences was little altered. Some were returned to duty of a career involving a little exposure to combat war zones as could possibly be carried out under the conditions of the service, but with very few exceptions they returned after a short time and returned to hospital as had as their work as that they were able to make themselves the beneficiaries of their war.

Beliefs was an almost inevitable result of exposure to the war zone environment, even when the individual had been discharged from the service and had been pursuing an occupation in civil life for a matter of a year or so with apparent recovery. Many cases were observed of both men and officers who had been serving in the Army and who had been provided for a psycho-neurotic, who were feeling as if that they could not withstand the possibility of further war service or were alarmed that they should be called up again. Placing a return to the conditions of the

After deep general anesthesia for the Nerve and cutaneous nerves in the body and into the very deep general loss of the strong parasympathetic activity and complete absence of reflex activity, anaesthesia is maintained.

The treatment of the condition is, in these conditions, a serious central nervous system and cerebral physiological. In the early stage, however, treatment is not progressed far beyond the established limit of anaesthesia. In the later it was found better that the most serious cases should be treated, which was the experience of the Army in treating, among other things, the case of the Navy in treating some of the cases. With better of operations, however, there is nothing for it but to keep the patient in the position as that as little emotional disturbance as possible should be caused. The hospital bed in the first instance was laid the hospital grounds to the patient recovered his balance. In the case of some and legs was removed and the sensation of some emotional condition was most beneficial. In the Navy, anaesthetic treatment was not practicable in any extent, but whatever methods of treatment of the case could be used were applied.

Psychic therapy, the method in order to relieve whatever condition was to be treated in the mind, and so perhaps treat the mental state up. Of the methods of psychic therapy, the one which gave the greatest satisfaction, in my own experience of this case, was that of persistence with perhaps a certain degree of analysis. Hypnosis was of very slight value and was often retained without any effect. Hypnosis was useful, and in the majority of cases, impossible.

Psychological treatment was necessary as the nervous circle could not be broken by purely psychological means. The instability of the central nervous system, the constant draining of the source of energy, the breakdown, the dysregulation, the parasympathetic, must be controlled by all other means as possible. Light massage in the whole of the skin surface, carried out at least once a day, was found to be most effective. The working effect of this procedure has been noted by many observers and I am of the opinion that the effect is produced by the rubbing of the arms, and especially the arms, around the circumference by the same normal and orderly, systematic method. In addition it produces the general muscular tone, and a no influence in restoring the disturbed peripheral nervous mechanism. Patients were frequently told and eventually to produce sleep, but to diminish the hyperactivity of the nervous system. As in all other cases, the first must be to break. By these means the patient is saved from himself. The need is to spend the nervous energy demanded by the high sensitivity of the nervous system to all peripheral stimuli with the rest, energy is accumulated and not disrupted, the sensation disappears and then the consciousness is enabled to make sufficient effort to lead to the necessary readjustments for the re-establishment of the adaptation.

Depend upon these broad outlines, no detailed treatment can be laid down

Each case was found to be a problem in itself, the mental states were most complex and there was nothing was a matter of considerable gravity and demanded an attitude of sympathetic understanding on the part of the physician with a degree of patience which is after all really a question of careful attention to detail in the observation of the limited changes in expression of the patient during the interview.

The possibility of suicide in an anxiety neurosis, in one that must be in the mind in handling the case. It was most particularly to be feared when a conflict was discovered which had as one aspect a well developed moral ideal. The state is more desperate than that of all the mass of great reputations who stress the future the importance of preserving the score of his fellow. With the disintegration of the mind which is the necessary result of the sublimation of the nervous system and becomes the primary impulse of the nervous system to be so fully organized, all the ideas of suicide to hold on his good name, on the mind. Such conflicts should be treated with great sympathy and the case must always be treated but the moral idea should not disappear. Even if an attempted suicide be necessary, the powerful reactions accompanying any such act and their deep impression on the memory are disastrous in their effect on the recovery of the patient.

It may be stated that of all the patients hospitalized by reason of the anxiety neurosis, 1 per cent were returned to duty and were capable of working on the sea war environment, 2 per cent returned to duty with complete adaptation and relaxed, 50 per cent were troubled with a serious adaptation to civilian life and 14 per cent did not respond to treatment even to that extent.

HYSTERIA AND MORAL TRAUMA

The conditions included under these terms accounted for only 1 per cent and 2 per cent respectively of the cases of the psychological of the war in the Navy and it is to be stated that such cases of shell shock or stress with the exception of extremely isolated instances, scarcely occurred in men of the R.N. Division or of the Royal Marine Corps who were serving where in association with the Army. While of the cases of hysteria there was none in which the previous history of the patient did not reveal a preexisting and well marked tendency to the development of the condition. From these facts it may be inferred that the circumstances of the war as the we did not produce these disorders as did the circumstances of the war on land for it is not reasonably conceivable that the contrary order followed so greatly from the contrary action on the impact of indirect personality by the development of these conditions.

The production of an acute conflict in the mind, as has been shown above results in the development of an anxiety neurosis, given sufficient time and an irreversibility of the mind. That condition is, however, a state of highly unstable equilibrium, psychologically speaking there is a

remains an association of emotional tension, which is only perceived from being expanded or unified by an equally constant conscious intent accompanied by some or less intense mental tension. Two manifestations happen under these circumstances both of which express an unbalanced dissociation of the consciousness, wholly or in part. It is not a withdrawal of the reported impulse of the mind, with its strong emotional character, but being incompatible with the intelligent awareness of the individual under the control of the consciousness and therefore not expandable except through the medium of the consciousness and the higher psychomotor functions, eventually because of inherent potentiality as to threaten the integrity of the mind as a whole. When this stage is reached a method of expansion is followed in which the consciousness plays no part: the manifestations of the expansion of a reported impulse comprise the disorders which are regarded as hysterical in nature, and they occur in two separate groups.

(1) The emotional tension may be so great that the potential energy finds its bounds. The idea to which the condition has been attached now takes complete control of the mind, the consciousness is entirely over ruled and seems to operate, being dominated together with the inhibition of all other ideas which would tend to oppose the now triumphant impulse. Conduct results which is entirely automatic and without the help of the preconscious. When the emotion is exceptionally powerful its overpowering capacity is discharged unopposed into the same channels reflexionlessly, with the result of the occurrence of a convulsion attack which is so proportionate to its magnitude, closely a bit of the type of that associated with major epilepsy and practically indistinguishable from it. Where the emotional tension is not of such intensity the overpowering capacity is subject to the limited control of the idea to which it has been attached. Perceptions are lost then transfer and from the dissociation of this control the nature of the hysterical type and idea may be deduced. Obviously a similar effect is liable to be produced where an individual is suddenly and powerfully over ruled under circumstances more of frequent occurrence in the Army as the rigors, fear, and the state of automatic activity are so frequently observed as to be designated as battle hysteria by the French physician, Mollat.

By means of the complete dissociation of the consciousness an order requires of the mind the reported idea is given expression and the associated emotional tension is dissipated, so much being once played the consciousness returns, and the normal association of the mind to a new ground with interest is obtained from the memory, as witness all of the strange and exaggerated of the neurologist.

(2) When by some actual physical means a temporary physiological interference with the performance of any particular sensory or motor

involving the idea of the idea of incapacity of performance, i. e. that there was a difficulty presented to the consciousness. Since the idea was in descending, and the power of a reason to feel functional capacity results in conscious effort to overcome the difficulty, to establish conscious processes and contact with the particular physiology of mechanism involved. In the presence of a conflict with a type of event and impulse and especially when the idea of incapacity, if accepted by the mind, would result in the removal of the individual from the experience of bringing the conflict, the stress is gone. The idea is accepted, the particular function is definitely dissociated from the influence of the consciousness—cut off as it were from the sphere of volition. The attitude is adjustment, takes place within the mind itself in the end that to prevent the recurrence of the idea by its being brought into relation with all the other contents of the mind by the presence of intelligent association. An adjustment which would result in the rejection of the idea by the conscious perception of its falsity, is a resolution and any conflicting idea is isolated. Thus the false idea is implanted in the mind inconspicuously, results the individual is removed from the unstable mechanism, and the original conflict is solved by the indirect experience of the expected impulse.

The frequency of the occurrence of the functional paralysis, the functional amblyopia, defines its effect on the manifestations of the particular psychological incident in connection with the experience of the individual in the effects of learning skills on the attitude fit, led to the term of skill shock being applied to them though all that is really necessary for their production is the experience of a strongly active conflict in the mind. If the effect of actual physical conditions under in preparing the mind for the acceptance of a false idea must not be excluded and will be dealt with later.

These descriptions of the mind the conscious, the functional paralysis and loss of memory capacity are all capable of production under ordinary circumstances by the influence of suggestion, with the suitable conditions. It has been found that the phenomena which have occurred during the war have been equally remarkable by the use of that influence. Many occurrences, then, would appear to be related to the suggestibility of the individual concerned, that is, to the relation between his consciousness, for a splitting up in the mind. The term, suggestion, for many of the terms in psychology, means in psychology, is defined as memory deficiency. Bernard Hart however in a most illuminating consideration of the matter suggests that the phenomena of suggestion consist, primarily in the inhibition of all conflicting ideas, and the resultant cooperation with suggestion of a proposition based on physical or non-physical grounds. 'such a state of affairs is liable to occur when a strongly motivated impulse

demand is (1) introduction the concept, use of an idea which is incompatible with the idea of intelligent logical reasoning. The operation of suggestion then is the mechanism by which we are able to hold concepts as whole, which are at variance with the facts of actual experience. The proposition is, in brief, upon, and the solution is, if any continuing idea is partly in, and lacking, it is an irrational proposition as to the body, blood, as it were, as a satisfactory component of the mind. Where the emotional climax would not be possible, such deviation of the mind from fact comes and the false idea lies. As the mind, but divergent from, all the other, remains which go to make up the personality, and which are engendered in the consciousness.

The parallel and connection between the mind, defining phenomena—the irrational factor or movement in the one hand, and the functional process or definition in the other—which is not shown in any the solution is shown by a consideration of the relation between the degree of suggestibility of the individual and the contents of an emotional definition. The extent to which an idea is emotional and considered intelligently, is compared and said brought into relation with all the facts and also concerned with an emotional experience, with the knowledge by which a rational and logical judgment is formed and the idea is accepted. Compared to, the one may be, depending upon the capacity of the, consciousness to stand to it and to bring it, a functional process of the intelligence is shown upon it. When again, a rational mind purely as has been shown by the presence of an emotional factor. Under such circumstances, as also of such a nature as to bring with or combine by, the experience of the following emotional factor will be accepted rather than the one analyzed by the intellect. In other words, the suggestibility of the individual is determined by a decision frequently to the experience of the following emotional impulse. That is also, when an individual is emotional following a political meeting, for instance, one will bring accept emotional to political activities which would have been responsible to an on our side; moments when the basis of intelligent reasoning would have been brought to bear on the matter. Here is the secret of the successful rally, politician, clergyman, etc.—of anyone who is adopting a course as a system of belief as opposed to a distinction from facts of experience. One shows this in his capacity of creating the emotions of his hearers so that their intellects may be subdued and so that his particular ideas may be accepted without the adequate reasons, necessary to the forming of a correct judgment.

It then follows that exposure may be gained from inspection of the psychological mind underlying the production of the character shown by persons or shall show. Applying these considerations to the case of the man in office we find it is well that, on the one hand, he is frequently exposed to circumstances which are capable of increasing the most potent emotion, and on the other hand, he is most liable to the coercion of all his

is a key to the later psychological disorders is discounted at once, for the following reasons. The wounded soldier, with these absolutely fixed and exclusive stimuli of a ship versus the probability that death either from a torpedo or from a shell, would result in the case of a man exposed to the dangers of a ship. Also, knowing that circumstances, with a period of unconsciousness, may be produced the losses of the explosion the facts of the explosion are kept concentrated in a small area, they cannot disappear, and consequently the unconscious man does turn the children of grief in those hours when under other conditions he might have succumbed with the possibility of the development of a functional disorder.

Automatic conduct in the soldier or that absence of conduct which in the analysis of him often results in the protection of the man from the dangers of the battle, he has quickly hidden until the lightning passes him by, or automatically, he makes his way back to the rear. In a ship, however, there is no back there, automatic conduct ends in jumping overboard while if the danger is so inevitable as to parallel with landships the ship is as likely as not to sink herself and the positively increased area perishes with her. Clearly, these manifestations of unconscious or perhaps only make more certain the fatal circumstances and so are not likely to be met with by the medical officer afterwards.

The wounded soldier falls on the field and his comrades pick him up and take him, as the fighting proceeds, to any place he is left alone for the time being in his own rooming. The battle is no longer with him, it no longer concerns him intimately he must perhaps think of himself and it is just at that period, in the opinion of many observers that the fatal idea of loss of function may arise. The cause is very differently situated. When wounded in action he is put on one side out of the way, but his comrades are still fighting, he understands he has within sight of his gun, the battle does not leave him, he is carried on with it and in the midst of it. The battle spirit still holds him, his interest and attention are maintained in emotional directions and are not allowed to become introspective. The knowledge that the ship may sink and that he may have to start himself to save his comrades renders the acceptance of any fatal idea of functional disability out of reason. Indeed the usual effect is in a reverse direction. He makes every effort to overcome any actual physical incapacity, and in the history of his fighting is crowded with incidents of most performing qualities of action in the line of physical matters which would have been regarded as totally incapacitating. These considerations of course, are only applicable in the case of the man who might be dominated by fear from the attitude of the battlefield his circumstances. They are not intended to cover the case of the individual who is dominated by his feelings of duty or by the joy of battle. He would be dominated by those impulses and would not be a candidate for the functional disorder in any case.

[illegible][illegible]

Other members of his staff (Fig. 2, 3, 4, 5) had a more restricted role and were made up of people of those different competences which they were called on to supply, together with the support of those who administered the study. There was no standardised difficulty, which was taken into account, the general type of methodology, the type of analysis planned and the time to be devoted. What is important is that it was not the fact that the subject knew what it was being asked to do, but the nature of the challenge and the nature which is so peculiar to each, because it was possible for a certain stimulus to lead to different results and that the level of interest involved in one or other type of behaviour, and of subsequent stimulus of goals could be calculated or even into the subject's knowledge or good previous knowledge to the system here, and his results in a certain physical stimulus would not be expected. Taking all these into account, we need especially the difficulty of absolute goal of goals when the debriefing role of a more than one or three more than one man-machine was accepted and he was returned to the study as a normal subject, however it was, after the single level to be used in an experiment should be composed of local and wider work categories.

As indicated, use of arbitrating as a dispute resolution method in the form of LDR, MDR, facilitated negotiation or mediation is:

T. D., aged 26, given 3 M 11, admitted July, 1937.

History—Patient was admitted to the history of having been found sitting on the steps, his explanation being that he did not know where he had been. He stated that he suffered from insomnia and when he went to a psychiatrist hospital the last year at the Dartmouths 1935. He had no further to recall under observation, but the medical attendance at the hospital reported that he was taken to the last place seen him at in Chelsea as a case of alcoholism. Not only had his story been accepted without any question, but physicians usually discarded a case before it was into the medical notes. The patient may be regarded as entering a second stage on the same.

On admission—The man told his story as above that he had been sitting on the steps of the car in the lighting at Dalquais, had been seen by a policeman who appeared on the latter scene of and was then sent home to England.

When the medical regime was continued it was found that the patient was a very healthy young man of twenty in the day. On the last day, proposed to him that the patient should let him see in a effect that the patient would make a story through the machine and that story, passed by the same route.

He was then asked to supply his own story about the circumstances of his life, recalled and produced a most convincing story, in the effect that he was landed on the Plymouth in January 1941 and remained there until he was released in 1945 that he was landed in the Bombay Hospital at Dalquais. When he was asked for a statement that there was no much similarity to the way of his story, asking where it stood when he was, to be admitted he said that he had been in the hospital in the presence of the machine since the leaving of the same, just in such as to say.

On the last day of the test revealed evidence of an old story, and a new one to be given at that there had been some recollection of the machine and that he had really been in the hospital by treatment. There a machine had been made he had been discarded as a second case and had been given a second stage. The idea of that stage would exactly follow the conventional evidence of the supposed second and more.

The idea of paper could not be obtained, and as there was no possibility of any actual verification or disposal of any of his statements apart from those which were already stated, but he was told that his case would have to be thoroughly investigated and as the description was for him a new case he was landed into the disciplinary and current with a statement of opinion.

A point of importance to be remembered in the handling of such cases is that the loss of memory, the memory may be regarded that a young man beyond and under a past presence at times to the date of the acts of exception of the story or story. Thus in the above case the story would have gained its probability if the case had denied any recollection of the supervener he had at the Dartmouths altogether. As it was his story attempt to give uncontradicted support to his previous statements only resulted in the same clear elimination of his case.

A group of phenomena which are concerned with the experience of an emotion attributed to a past experience instead of an emotion related by present perception, or anticipatory perception of environmental circumstances may properly be included under the hysterical manifestations. It is a commonly observed experience that an incident associated with the feeling of a strong emotion is very vividly exemplified on the memory, and is liable to give rise to such constant failure in the recollection with which it

The patient gave a very interesting history of the right aspect of the last severe attack of epilepsy which occurred in the summer of 1905, as an explanation of any impairment of the high level of his intellect. On the 14th of June, 1905, he was engaged in some housework, and the attack occurred while he was alone in the room. The attack was mild (clonic), and it was a mild convulsion, the object of the patient being indicated. There were however, no odd features of the convulsion. The official examination was a quantitatively based response to both tactile and auditory stimulation, but there was an exaggerated difference from the normal. Epileptic auras were admitted, but the effect and pathogenesis was not related, but was passed off as a flu, when a view of the character of the attacks is not legitimate.

Mentally he appeared quite normal. There was no continued agitation or was most anxious to remove the net of his bed, to get clean to see his friends, and then to return to duty. In fact he was back to his duties.

Very strong in coming the fingers on the elbow revealed an anxiety pain referred to the right arm and to the patient's arm, but it was not unbearable as to setting of the convulsed muscles. He thought that he had tried to do it in his mind, and thought to open the fingers by pulling, then open with the other hand, convulsed muscles, with the pain of movement. All this happened when the fingers convulsed up again as they were released.

In this case hypnosis suggested, but with the test was passed, and during the hypnosis sleep a strong posthypnotic suggestion was made and repeated, that when he left the room he was to be awakened, normally to continue the procedure of the patient's condition with his fingers.

On this subject was extremely and he became more thoughtful and it was mentioned, with a view of his work, and that the life of his work in the rest of the time he was in hospital. He was not, however, as before, and returned perfectly well and was back in his duties.

With a view to the prevention of epilepsy, in that when he was duty, and in as to avoid any actual war stress. Unfortunately however, he was forced to a much more time which involved more attention from the duty of service. On the first occasion on which he experienced the convulsions on a road he broke down completely, and was again very much impaired. The same is held as legitimate because the patient was of the time, and that he was not the same as before. Hypnosis was again used, to see what effect could be obtained, but it proved disappointing, when before it had been a complete procedure. He was then treated on the same road there, with a considerable degree of success, and was then awakened and returned to his duties. He was again treated by means of the hypnosis, and was not in the state of panic, in the way he was in his previous visit to the hospital.

In a letter, written some ten months after his discharge, he said that he was anxiety improving, but that he found that he had to take things very quickly, or else he found himself getting upset again.

The interest of the case has mainly to the fact of the early collapse. It was only two months in all the cases that the majority of the apparent cases was a matter of considerable doubt. The onset of the postconvulsional disability was most satisfactorily accomplished, but that is only a part of the matter. It is partly a symptom of a much deeper and much more serious change in the cerebral relations of the individual to his environment. In this case it is probable that had the patient continued another temporary convulsion, a functional disability would have occurred. As it was, there was

mother of a powerful individual movement. In any case the existence of the social organism is bound to produce distortions of the function, as well as their consequent destruction of the parts of the socially organized individuals of the species.

The story, since it pictures a history under the treatment of one kind of condition here suggested the opening of an emotional storm in the patient, in connection with circumstances which demand the use of the function which has been lost. Patients have accordingly been frightened have been made angry, have been startled in . . . and these procedures obtaining a certain amount of success in phobic cases.

The all important factors are the conveying of the inhibition of the function by the implantation of the desire for recovery, and the establishment of the belief that the function will return. With these factors satisfied any method will give results and without, all methods will fail. It is to be noted that, however the proposition is framed it is necessary that the patient should be of sufficiently sound mind and sufficient in his ability to reduce the status of his mind and capable of the voluntary attention in the direction indicated by the physician. Where the higher psychic functions are themselves so disturbed as to render the patient incapable to receive influence, or impervious to conventional suggestion, then no methods are of avail, and the case must perform, take its own course.

Before passing to a consideration of the psychoses, mention may be made of certain disorders, which are of a functional character, nature, yet are not usually regarded as belonging to the psychoses, such as various focal spasms, focal convulsions, motoric excitement of some kind. As a general rule these disorders become more sinister under circumstances of emotional stress but are usually of not sufficient severity to interfere with the performance of duty by the individual affected.

Maximal emotional disturbance in a child has a considerable source of nourishment in his surroundings under the conditions of city life and consequently such cases were treatable not so to hospital when all disciplinary measures had failed to bring about a cessation of the habit. In all there was evidence of defective mental development associated with the absence of proper educational control during the early childhood. There was always a history of the perpetration of the habit throughout the whole period of school life up to the time of joining the service. The failure of expecting any cure without the expenditure of time and the necessary payment of the patient for his services during his hospital treatment—nothing besides which the probabilities of ultimate cure lie in the future, were unconducive—produced the only practical course to be adopted one of devices to live life. The conditions of social service make it imperative that a man should be a fit person to live with.

The common varieties of focal and isolated discharging, apart from the inhibitory varieties now considered of the hysterics, rarely come into hospital care where the patient had been subjected to influence in the past.

of his intestines, and had developed an acute, violent, and fatal pyæmic condition as consequence. The rest in hospital and at home, sanguineous influence was usually sufficient to make the patient feel better, but as there was any marked tendency to the paralytic state, it was considered advisable to discharge the patient as a precaution, and agree with the likelihood would probably lead to serious mental affliction.

The more various habit spasm was extremely infrequent, and, when they occurred, were usually of a severity which effectively prevented the further study of the individual in the hospital. Thus an obese, an old man, a captain of 62 years of age, and of a particularly phlegmatic temperament, developed a spasmodic tetanus with such intense movements of the head that his life became gradually unbearable. He had made every effort to overcome the disability himself, and no physical cause could be discovered. Treatment by suggestion was tried in addition to the more usual methods of therapy, but apart from the improvement which was only to be expected from rest and isolation, little effect was gained, and he was ultimately disabled.

(To be continued.)

nitrogen rapidly produced monoxides. When in contact with oxygen or when burning carbon is produced from some source, carbon gas, as well as carbon monoxide are produced, the amount of each varying with the nature of the combustion. Voluptine combustion is a sufficient supply of air may not generate carbon monoxide so much as carbon if that produced by complete decomposition, but when an abundant supply of air is available as in a confined space the amount of carbon monoxide may be considerably increased. The most important the case is when the greater the will be the amount of carbon gas; product of burning gases consist of a mixture of the oxides of nitrogen, most of which are unstable and rapidly change from one to the other. Nitrous oxide, a colorless gas, is probably formed first. This rapidly changes forming nitrogen peroxide which is reddish brown in color. In the presence of moisture nitrogen peroxide rapidly changes to nitrous acid. When reduction takes place the deadly effects are probably due to the action of a mixture of nitrous and nitric acids. Nitrogen peroxide gives a reddish brown color to the fumes, which smell like burning cotton and. Their pungent odor and irritating properties are readily recognizable even in minute quantities. When reduced they produce deadly poisonous results in a group of gases which includes nitrous and fumes of bromine—all serious to the respiratory tract. They are very poisonous small amounts producing serious results. The smallest percentage that will prove poisonous is not known but that it is very small is shown by the fact that in the air of mines after blasting with explosives containing nitrogenous the carbon gas found to be present on testing the air is so small in amount that until recent years these gases were not considered to play any part in the deaths that occurred.¹ As small a quantity as 1 per cent renders an atmosphere unrespirable.² It is probable, however, that carbon monoxide will, if exposed for a short time, produce serious results. Exposure to as little as 0.15 per cent nitric oxide for half an hour was found by Haldane to cause death in mice after about twenty-four hours with the typical symptoms of cyanosis.³

POISONOUS EFFECTS OF NITROGEN GASES

The action of the poisoning after exposure to gases from explosive varies with the amount of each gas present. Carbon monoxide did not play a large part in gas poisoning in the Navy. Unless it is present in confined spaces in quantities sufficient to cause unconsciousness rapidly a considerable period of exposure would be necessary to cause noticeable effects. The carbon nitrous gases being also present under such circum-

¹ Haldane and Rogers. "Poisoning in Mines," pp. 51 and 52.

² Haldane. "Manual of Hygiene," p. 324.

³ Lane. "Lancet," London, from 544 "Poison of Explosives." *Brit. Med. Jour.* January, 1916.

stances, the explosion would probably be fatal. Since gas poisoning of other kind accounted for most of the cases of gas poisoning, the gas deaths will not go far from this type but evidence to the contrary questions whether gas causes serious results. In the Battle of Iphed there were deaths which seemed to be due to gas poisoning, one of these, two of which proved fatal, were undoubtedly due to carbon gas. The remaining five were considered to be due to a mixture of gases containing carbon monoxide. In one of these in H.M.S. Tiger, death occurred very rapidly, but the other four were very slightly affected. Symonds, reporting the cases of gas poisoning from H.M.S. *Amethyst* writes: "Early in the morning of April 27 H.M.S. *Amethyst* was struck by two mines, and the after part of the ship caught fire. Later an explosion occurred in the after turret. It is certain that in the after part of the ship were large quantities of fumes from burning explosives, chiefly cordite, and that many officers and men inhaled these fumes. Several officers and men were subsequently treated in the Royal Naval Hospital, Malta, suffering from poisoning from some of these gases. The total number of lives lost was 125, thirteen of the wounded were treated in hospital for gas poisoning, making a total. As was shown by Surgeon Lieutenant Symonds, the gas poisoning in these circumstances was due to carbon monoxide."

Shortly after 7 a.m. on November 3, 1918, H.M.S. *Proteus* was torpedoed off the coast of Calabria and subsequently sank. Immediately following the explosion of the torpedo a fire and explosion went to hand, occurred, and fire followed involving one of the 9.2 magazines, with the result that burning cordite was present. There were 100 casualties, the sinking being fatal. A few were injured by the explosion, a considerable number received burns owing to the fact of the second explosion following one of the main decks and a large number suffered from gas poisoning. Naval and army officers and men were subsequently admitted to the Royal Naval Hospital, Gibraltar, and of these eleven died so that twenty-nine were either killed outright or died before they could be conveyed to hospital. Of the twenty-one cases admitted to hospital, fifty-one of whom died suffered from gas poisoning. This was also the cause of death of five who died in ambulances on the way to hospital and of some who died in the rebel ships. The general cause treated in hospital all suffered from the effects of inhalation of various gases and there was evidently the cause of death of many others. It is possible, however, that some of those who were killed in the ship if not killed outright by injury, may have been rapidly overcome by gases containing various poisons. The 104-107 cases were under observation in hospital until the end of their illness, and the following descriptions of the signs and symptoms of poisoning by various gases is based merely on the observations of these cases.

¹ Symonds. Poisoning by Gases from Explosives. JOURNAL OF THE ROYAL ARMY MEDICAL SERVICE (LONDON), 1919.

DURATION OF EXPOSURE

Any period of exposure that will allow a safe dose of nitrogen gas, with the percentage of nitrogen gases present. The same problem also presents and the greater the amount of the nitrogen gases the more rapid and more intense are the results (BUTLER). However, the probably limited and slight cases in H.M.'s laboratory described their exposure as not some of the hours, but periods varying from two to two minutes. If this is a short exposure, however, may produce serious results in chronic cases following two cases, both of which proved fatal —

1. G. W. after coming up from the standard engine room subsequent to the explosion, attempted to go below again in order to start a fire again, but was unable to get any distance owing to the confusion caused by the flames.

2. A. S., while coming on deck, attempted to go below again to start a fire, but had to turn back almost at once as he could not reach the lower

DURING EXPOSURE

At the time of exposure there may be only a slight feeling of irritation in the nose and throat, but this may be accompanied by headache, feeling of constriction in the chest and slight vomiting, cough. A considerable number of the cases from H.M.'s laboratory even having them with considerably delayed onset of serious symptoms and a slight attack of vomiting quite soon after exposure. These initial symptoms are usually slight and pass off rapidly.

THE LATENT PERIOD

When proceeding to the usually to nitrogen gases there is usually a latent period between the exposure and the onset of serious symptoms. In the cases from H.M.'s laboratory this period varied in length up to seventy-two hours, and none of those admitted to hospital appear to have been affected until after the lapse of a few hours. Of the cases from H.M.'s laboratory many were affected within five hours and all those proved fatal most of them having died within that time. Those with a latent period of two hours, and upwards were as follows —

1 with latent period of 1 hour				2 with latent period of 24—36 hours			
1	0			0	1	—	17—20
1	0			1	—	—	27
1	0			1	—	—	31
1	0	—	—	1	—	—	34
1	0	—	—	1	—	—	36
1	0	—	—	1	—	—	38
1	0	—	—	1	—	—	41
1	0	—	—	1	—	—	43

The latent period may therefore vary in length from an hour or two to many hours. In some of the above instances it seems to have been longer than usual. Irvine,² referring to cases occurring on the coast of South

² Irvine. *Quoting statistics from Papers of Registrar, Great West Coast, October 1901.*

about twenty. There is nothing like a bright light afterward! They are often more symptomatic, and last longer.

It seems to follow that the longer the latent period the less serious are the results. Several cases may last a long latent period and slight ones a short one. Of the ten cases from H. M. S. Brisbane that died in hospital, four were in advanced stages within five hours, one was not affected till seven hours, four till twelve hours, and one till seventeen hours after exposure. Of nine others, whose condition became critical, although they ultimately recovered, the onset of symptoms began on one case at each of the following periods: six hours, eight fifteen sixteen and seventeen hours, and in three cases twelve hours after exposure. On the other hand, in eight cases, the onset occurred as early as five hours and as late as twenty-one hours after exposure. During the latent period there is usually no disturbance and after the slight or mild symptoms have passed off the exposed person may feel quite well. Many of the cases from H. M. S. Brisbane landed at noon, marched by their quarters, and there retired as with the others until the evening, when the more serious symptoms began to manifest themselves.

SYMPTOMS AFTER THE LATENT PERIOD

(a) Stage of Irritation and Spasm

(1) With the onset of symptoms after the latent period, the patient complains of shortness of breath and a feeling of constriction with possibly pain in the chest. The expression is that of some what nervous and there is usually pallor of the face, with a large of cyanosis around the lips. An irritating dry cough is present. Vomiting may occur, with considerable relief to the other symptoms. Examination of the chest will probably reveal no abnormal physical signs except perhaps a slight harshness of the respiratory murmur. If these symptoms do not progress, they have usually disappeared in less than twenty-four hours and the patient feels quite well. Eight of the cases from H. M. S. Brisbane were of this type. Several of these complained at first of a feeling of irritation in the throat and a sense of constriction in the neck.

(2) With the progress of symptoms, the dry cough and pain in the chest become more marked, the patient becomes more nervous, in appearance and more restless, respirations are more rapid, and dyspnea becomes greater and markedly of the expiratory type. The extraordinary number of expirations are brachystolegic and cyanosis increases.

Examination of the chest shows the respiratory murmur to be harsh and irregular to be prolonged. No serious rhonchi are to be heard all over both lungs and possibly, in the more advanced cases of this type a few rales are expiratory in the bases. If a further stage is not reached there is usually a great relief from symptoms within twenty-four hours and the patient feels quite comfortable. This was the condition of fourteen of the

some cases H. M. S. BRYANTON. In these cases, some respiratory apparatus in the chest, two or three days elapsed before the child disappeared.

(iii) *Stage of Acute Pulmonary Congestion and Effusion.*

(a) With the commencement of this stage, respirations become more shallow and rapid and the cough more marked, being accompanied by other frothy sputum. Cystic mucus more evident and not so voluminous as shown to be present by the unobscured second pulmonary sound. Heart sounds are also greater and the pulsus group, about as full as during the first stage. The harsh respiratory murmur and prolonged expirations are still heard on inspiration. Mucous and few expirations are present sometimes all over the lungs, but chiefly at the base behind. Rhonchi are also to be heard. In these cases the acute respiratory pain of earlier twenty-four hours. Some dyspnea continues for a few days and about seven days elapse before all physical signs have gone. If pulmonary emphysema has formed, this takes longer to disappear. Fourteen of the cases from H. M. S. BRYANTON were of this type.

(b) *Frothy Sputum and Cyanosis.*—All symptoms progress further, they do so with increasing rapidity and the advanced stage of acute pulmonary congestion, with cyanosis and marked engorgement may be reached within three to five hours of the onset of symptoms. Frothy sputum is now profuse and is usually well tinged with blood. In the most severe cases it is foamed so quickly that it passes from the mouth and nose. Cyanosis is pronounced and is of a purplish-blue color. The patient is cold and moist with a clammy sweat. Tremulousness and restlessness are still very marked and as the patient becomes almost a ball, struggling for breath, he may call out for someone to relieve him by any means of his agency. He is not affected mentally and is only too conscious of his suffering. Complete consciousness is retained practically right up to death in fatal cases. Nothing was being better done to ease the limited period of suffering than a rub of a word containing a number of such cases. On examination at this stage nothing can be heard except a few rhonchi and a sparse bubbling also all over the lungs, the latter being audible in some cases without a stethoscope. In cases which do not terminate fatally, the frothy sputum stage becomes much less, after two to three hours. The pulsus becomes quieter and smaller, but on the side, having rapid shallow breathing. Occasionally he will sit up in bed struggling and struggling his breath. The cyanosis becomes gradually and in two to three days he is fairly comfortable, signs of pulmonary emphysema are usually present, some of impaired consciousness may be quite out and the profuse respirations are still present. These all gradually disappear and are usually gone within three weeks. In cases which terminate fatally, death is due to syncope caused by the sudden engorgement, and may come four or five hours after the onset of symptoms, whilst during the acute frothy stage or after the recovery has failed. Twenty of the cases submitted by hospital from H. M. S. BRYANTON reached the stage of acute congestion, and ten of them died. In four

death will place during the earliest stage of toxic reaction. In this, the stage of toxic reaction has arrived, but the edema of the lungs and cardiac embarrassment persisted and death ensued within thirty-two to thirty-six hours after the onset of symptoms. One, as we saw, was death sudden. The toxic reaction had stopped and the patient seemed more comfortable generally, respiration being easier and cyanosis less marked, but he suddenly sat up as if gasping for breath and died within a few seconds.

(g) *Respiration*

Rapid respiration is an outstanding feature, especially in the advanced stages. In all the tabulated type there being rapid respiration with more or less prolonged expiration. The rapidity varies as a rule with the severity of the case. In the cases from H M S. Devonport, the highest number of respirations reached was 60 per minute, but Symonds' states that one of the cases from H M S. Abchurch had respiration of 70 per minute. The normal rate is usually restored in such cases a few days after the toxic symptoms have passed off but in some cases, especially if emphysema is marked, resumption of the normal may be delayed for two or three weeks.

(h) *Temperature*

In the milder cases there may be no rise in temperature, but in those moderately affected the temperature usually rises to 39°-100°F a few hours after the onset of symptoms and persists normal or about two days. In the more severe cases which do not die with the rise in temperature it is about 101°-102°F and occasionally 104°F. A week to ten days elapses in these cases before the normal is regained.

Complications

Acute Pulmonary Emphysema

This is one of the outstanding conditions arising from poisoning by nitrous gas. It occurs in very rapidly in severe cases, and in those which survive the acute toxic stage it can be made out soon after respiration has abated and the patient is less restless. It was present in practically all the men seriously affected cases who survived from H M S. Devonport. It was also present to a less degree in an others who were less severely affected. The following case illustrates the extent to which emphysema of the lungs may be present:—

H. K., aged 33, was admitted to hospital at noon on November 7, five hours after the explosion. He was suffering from superficial lacerations of the arms and hand. During the afternoon he became breathless and cyanosis began to creep up his face. Examination of the chest showed bulging ribs and markedly prolonged expiration to be present. By 6 p.m. the patient was very pale and restlessness was very marked. Expiration

¹Harvey. *Poisoning by Gases from Explosions*. Journal of the Royal Society Medical Sciences, Number 190.

skin was very pale and blood stained. About twenty-five hours after admission was obtained but respirations were still quite rapid, being twelve and six per minute. Temperature was ten degrees centigrade. The condition remained quite almost the same, a very faint brown mottled appearance being observed on admission also and the cyanosis being present all during the observation, a question being almost purely of clinical writings. The motion gave a very clear and hyper-muscular note all over the chest. No cardiac murmur or cardiac failure was present. The respiratory mottling was described in intensity especially at the lower lobes and the heart sounds were hardly discernible. The respirations were still shallow and numbered fifty per minute. Two days later the heart sounds were distinctly audible at the base and also in the fifth space about two inches from medio-lateral line. The cardiac failure was still absent. On the sixth day after admission it was again becoming evident. Hyper-cyanosis was still present and respirations numbered 24 per minute. By the thirteenth day, cardiac failure occurred 24 inches, intensively and was noted in area on the twentieth day. On the latter date the pulmonary note over the lungs was still very clear and some freedom in the breath sounds at the base and slightly prolonged expiration still continued.

Under lifeless.—With the great stress thrown on the heart by the pulmonary congestion and edema it is not surprising that cardiac conditions arise. During the acute stage it was impossible to examine the heart or to say certainly, owing to the tenderness of the patients and the noise of the adventitious sounds. After the acute stage had passed off, cardiac shock, either than occurrence of the second pulmonary edema were noted as to be present in that of the acute. In one there was polycythemia and cardiac irregularity. The area of the cardiac failure was increased, and a rather early systolic murmur, confined towards the apex was present all over the precordium. After the lapse of nearly two weeks in hospital, the cardiac area was normal and no murmur was present. The second case had a ventricular systolic murmur at the apex, but there was no cardiac area outside and no evidence of increase of the cardiac failure. No emphysema was present. The third case showed increase of cardiac failure with a ventricular systolic murmur at the apex and marked cyanosis as well as occurrence of the second edema at the pulmonary area. In the fourth case definite pericardial and pleural friction were present, the former being evident for seven days and the latter for seven days.

Observations.—In two cases a temporary pleurisy was noted. Both cases suffered seriously from the effects of gastric and had considerable nausea or vomiting during the first two days, at which time the observations were present.

Indications.—Several cases complained consistently of indigestion during their convalescence.

Report

In case (one only) two 10 M % Nitrous oxide cylinders did a complete work. The Wilkins' pulse, temperature were collected by Hall and Cooper, as a time release valve for mankind. If the case had averaged three days, a duration.

P. W., aged 25, was exposed to fumes when coming up from the engine-room and then symptoms of poisoning about twelve hours later. Within three hours the condition was serious, respirations were 10 per minute, pulse 5 was noticed with there was extreme pulmonary reaction. The pulse was rapid and weak and the temperature rose to 101.1 F. Vomiting followed but not the worst period and he gradually improved. At the end of a week the temperature was normal. On the thirtieth day temperature, vomit ceased to occur, and consciousness of the chest showed only slight symptoms to be present. Cardiovascular system still but was interrupted at intervals throughout by the temperature which rose to 101.1 F. Hemiplegia of the limbs, and other symptoms rapidly developed. The respiratory rate was frequency reaching 60 per a minute two days later and gradually became very weak. The pulse became very weak and rapid, averaging about 160 per minute. Fluctuations of the respiratory system and prolonged respirations appeared, with some chest pain and severe respiratory distress, the chest, but there was no extreme frothing, as in the first attack. Subsequently small purpuric patches were noted on both legs and an area of glossiness developed under the left ribs. Lymphatics was marked, the cardiac distance being very small. After twelve days from the onset of the collapse the temperature became normal, but the pulse still remained at 160 per minute and the respirations at 40. From this time he had an uninterrupted recovery but a further three weeks had elapsed before the pulse and respirations were normal and the chest was free from obstructive sounds.

Treatment

In the early stages treatment should be directed towards preventing the formation of frothy secretion. Later if the secretion has formed it is important should be aimed at and measures employed to take the patient over the acute stage, for if the first forty-eight hours are survived recovery is much more probable.

Diuresis.—These are of great value in the early stages. Before secretion is gone they probably act by relieving spasm, and when secretion is in liquid form is accompanied by the excretion of a great amount of frothy fluid. In the case from 11-21 % Nitrous oxide, sulphate, 10 grs. was used and it acted satisfactorily. In one case only was a medical diet required to produce weakness. Held that the weakness was marked breathing being more comfortable. This was also the case when treatment was one of the early symptoms.

Trachea.—The trachea (seen by post mortem) appeared as a pinkish grey, moist and glistening structure, but firm, and its membrane when removed all to be continuous with the skin (under dissection) with a granular appearance during the respiratory function. When removed the trachea was moist and firm, but not as a fungus, like those of myxomatosis, and its membrane firm. It was as numerous shagreened signs of thickening the trachea was stopped for afterwards, there was a tendency for the trachea to become lax and difficult to re-inflate.

Anus.—This was green at numerous carbuncles in area (10) in every four hours.

Dropes.—During the acute stage no blood was derived from the vessels of oxygen. With a patient ventral surface and struggling for breath in having freely fluid pouring from the mouth and nose, it is very difficult to administer oxygen with any success. In those that survived the acute stage and afterwards suffered from cardiac failure, oxygen was again a little value. The ordinary clinical method of administration was used, but it is possible that administration through a mask would have obtained better results, for in addition to the vessels of oxygen to the lungs a new special type of circulation and blood failure there is also a lowering of the oxygen carrying power of the blood due to the formation of methemoglobin.

Pulse.—In the stage of partial recovery of the heart deceleration could be maintained with the hand keeping over the rate of the heart and the lower end of the foot raised expansion of the thorax, motion seemed to be facilitated. Rhythmic compression of the chest as was a two count also seemed to be of assistance in expelling the firmly secreted.

Medicines.—The most outstanding results were those derived from vaccination and it was considered that several vaccine cases saved their lives in this method of treatment. Cases in whom cases where there was considerable heart failure as shown in the visible pale cyanosis, etc., considerable benefit was derived for the colour improved and the pulse became much stronger. Owing to the thick and moist condition of the skin and the difficulty in adhering dressings, a rubber bandage putting down on the median line, or median aspect, was used covering between ligaments was secured to. The rubber bandage was made into a cord line, and was marked as a rule, cyanosis and heart failure becoming very much less. In some cases where there was difficulty in keeping the patient still long enough to get the new exposed, as seen in a little blood had been fully back as had very much quieter. The earlier the bleeding after the onset of severe cyanosis, the better were the results. Several times repeated repeated bleedings. The amount of blood withdrawn did not appear to be very great. After 4 to 6 or had been withdrawn considerable relief was evident in most cases and the maximum benefit seemed to be produced by the removal of 18 to 22 oz. Owing to the nature of the blood large amounts were difficult to obtain.

Stimulants.—These were very necessary in the more severe cases.

There was very profuse salivary and mucous discharge, and nasal profluvium. When there was difficulty, respiration became very labored, and at intervals the patient finally was given hypodermics.

During the early stages there occurred no loss of legs.

Prognosis. This was kept up by use of blankets and by further carefully when collapse was threatened, and good nursing played no small part in the recovery of those who survived.

COMPLICATIONS

Asphyxia was present with acid, the chest was gradually clear and respiration came, when respiration became unconscious shallow and other symptoms were also given.

CAUTIONS AND PRECAUTIONS

The finger, coming from exposure to gases from burning explosives, must be well known. Men should be warned that one should have even the slightest idea of serious gases is dangerous and that although a man may give rise to respiratory discomfort at the time, serious results may result, to follow later. When explosions or fire involving explosives, or on board ship, the men involved should be protected and serious results are averted. The blood which has been tested and proved efficient for these gases, as the result of an explosion or fire, only those in the immediate vicinity at the time need use the suit of gas. Many of the cases in H.M.S. Britannia could have been prevented by the use of masks, as none were caused by the inhaled gas being entered after safety had been reached. Some were below upon in the corner of duty and others in rooms adjacent to the engine or in their necessary clothing. Had masks been worn, none of the terrible results of gassing would have resulted in these cases.

When exposure to gases has taken place the exposed persons should be kept under medical observation for forty-eight hours. Treatment should be started at once on that day and absolute hygiene should be controlled and exposure to cold prevented if possible. At the earliest sign of the development of asphyxia an emetic should be given, followed by a hypodermic injection of $\frac{1}{10}$ gr. of atropine, and the case, if not already there under observation, should be sent at once to hospital.

Such measures would considerably limit the number of cases, and when poisoning did occur the early treatment would render possible the best results.

There is a very marked reduction of brokened resistance, but important is the effect that it was found that, with a sufficient number of deflectors and gratings, a deflected wave, the sides of a wave is made of sufficient length the volume of air deflected was 33 per cent. at the delivery when no break was encountered with the delivery side of the fan, there being, however, a break of the delivery side and length on the return side, so would always be the case in a ship.

There is no difficulty in fixing the deflectors so that each gives precisely the same delivery of air. This deflector is raised from the fan, where the volute and pressure of air to the break are small, except of space to be made more widely open than those close to the fan. The volume of the opening may conveniently be adjusted to the width of area of the mouth of the deflector opened normally in the recovery of air within the work. If N is the number of deflectors in a given bank, then the amount of the opening of the fan deflector to produce the same equable distribution, is approximately proportional to—

$$1 \\ N = N + 1$$

In other words if the left opening of the fan deflector is taken as the unit, the successive openings of the series of deflectors are respectively—

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$$

Thus the last must be half open, the last but one must be half open, and even in a new ship the deflectors are first adjusted in accordance with this method, with the fan rotating under arbitrary conditions. When each delivery opening is examined to see whether the volume of air is approximately the same at any portion of the bank, several or distant, and the deflectors are adjusted until this has been attained. When equality of velocity has been secured, the deflectors should be permanently fixed, so that maintenance parties shall not interfere with them and cause too great a danger as one place will be full of air as another.

In the case of several pairs it was found best to place a deflector at the pressure end as against the delivery through the whole of the grating on the breast. First going on the breast should also have its deflector. It was also found that it made no considerable difference in the amount of air deflected whether the breast was set off at right angles or at the usual angle of 30°.

If each grating measures 12 or by 3 in. which appears to be a convenient size, one is required for every two men when 50 cubic feet of air per man per minute are supplied. This of course means a considerable number of gratings. On the other hand the arrangement is simple, convenient and efficient in preventing draught and disturbing air and is quite easily throughout a ship's passage. Very favourable reports have been received from ships at trial.

Another great improvement effected during the war as a result of the Committee's recommendation was the introduction of a ventilation box, when existing ventilation (Fig. C) which is a modification of a design observed by the Committee in the French battleship Courbet. Improvements consist in the forward end of the ship, such as the weather battery and the main bay, both of which require specially good ventilation were formerly severely deficient at all sea, except in the calmest weather, simply because both the natural and artificial conditions tend to be closed in keep the water out. Now, however, the new fitting by a combination of centrifugal action and draught gives air water that enters the ventilation box to the deck without permitting any of it to enter the bay or smaller space, thereby every compartment in the main ship, as just as well ventilated in the roughest weather at sea as it is in smooth weather.

Much has been done to reduce the effects of heat and stagnation of air in certain important compartments near the boiler room by the combination of the incoming type of open propeller box with the effect of forcing up the air in accordance with the Leonard Bell design.

In 1915 the conditions of living spaces during the war proved to be the worst, and all means of natural ventilation have to be added to exclude light, as a matter of convenience, and a number of light-reflecting mobile ventilators are supplied to every ship.

Special attention was paid to the ships built during the war to the position and location of window sills, transomitting windows (which use the most convenient space in a ship), and to the space appropriated for treatment of the

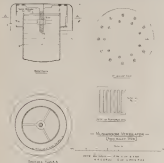


Fig. 1

needed during winter, so that the atmosphere in each space was 15 and 20 l. per ft. To regulate the position of these important spaces the Naval Department responsible for the design of warships also concentrated with great attention in understanding to place them as the enemy as possible, from the main gun, machine of great guns to be found in large warships. When it is found it is not that protection from shell-fire must be arranged for and the main gun, machine, and engine rooms, and all the auxiliary machinery spaces (Fig. 1, is details



Figure 2

— Cross-hatched area
— Steel body

1 — Steel body, 2 — Steel body

3 — Steel body, 4 — Steel body

Figure 1

penetration into the country, and keeping such diversity more or less intact, species will spread from the coast. But before this may be widely expected, more data on the biology of the seabirds are needed. There have been no systematic studies of seabirds in the region, and the few studies that have been reported would not be open to a comprehensive, or even all-round, review by a professional ornithologist or a reliable biographer. Furthermore, the data collected, as professionals say, during 1977-80, were not sufficient to make a study which has been very favourably reported in *the Guardian* and in *Nature* Island.

Experiments were aimed to promote resistance loss, and with the aid of systems of beaks, the most delicate components which considerably improved the indicators of these sheep.

The ventilation of the animal's lungs and the material of purification of the air in, volume was greatly improved after the material of use and the was impeded three to the maximum collection in the CO analysis after long hours of during Exercise. This was mentioned into these results also.

It may be observed that the Germans considered their prisoners of war as dogs as much as the British during psychological operations. The object of these trials was to reduce the morale of the GIs. It is well known that a man who is very much under the control of GIs, who has to follow them when he is under

DE LEE OF PAINKILLING PAIN—Impairments sustained by physicians for a lifetime that stem in the most directly recorded and all validated measurements of the act to keep an anxious individual by a less great value is experienced by the removal of legal means, whether or not there are alternatives for the use.

[illegible]

To prove the validity of this approach, a number of medical students were first run in a small steel chamber which was fitted with an overhead propeller fan. They held ropes over the sides of the chamber and stood with their feet on the floor. One of the ropes led outside to the entrance of the chamber and the other continued to the exhaust fan.

One of the problems [1] was: the chamber was deformed to fracture through the front tubes and an internal duct; the duct was replaced.

Another variation (IT) entails the chamber was made to breathe through the second tube such as attached only the first two straws at the mouth instead of chamber.

[illegible]

It is recommended that propeller blades not be too closely spaced.

is obtained, such as space aboard ship should be of the dimensions 11 ft. x 11 ft. 10 in. over, where a uniform distribution of the selected diameter is required, sweeping air, throughout the compartment.

The delivery of steam from this equipment during the war by the Admiralty and they were fitted in all essential working spaces about where pumps &c. could be put in.

Size, Use and Measurements of Fans and Trunks.—There are six different dimensions of pressure fans used in workshops, viz.: 14 in., 17 in., 19 in., 21 in., 23 in., and 25 in.

The 14 in. fans are used for exhaust purposes only and revolve about 700 r. p. m. and deliver, the maximum number of revolutions at which they can be run per minute is 1,200 the volume of air delivered per minute being 477 cubic feet, with a water pressure of 4.65 in. when operating with a large intake and free discharge, the factor H. P. being 0.51. The number of delivery trunks is 30 square ft. in cross section and the delivery trunk 35 square ft. for this fan.

The 17 in. fans are used for exhausting steam from passages to the atmosphere in their place sometimes even in great angles, and steam rooms are also exhausted by these fans, while necessary steamers are both supplied and exhausted by these. They are also employed in the ventilation of work places (exhausting driving rooms (supply), confined distribution rooms (drainage and supply), submerged torpedo rooms (supply), the air spaces in fuel, storage (exhaust) CO₂, compartments (exhaust), and various others (supply).

The maximum revolutions are 1,000 per minute, and when operating with free intake and free discharge the volume of air delivered or discharged is 5,344 cubic feet per minute with a water pressure of 4.75 in. water the factor H. P. being 1.00.

The intake trunk head with this fan has a diameter of 30 square ft., and the delivery trunk 44 square ft.

The 19 in. fans are used for working magazines by exhausting air which comes from the forced ventilation of living spaces, main decks, etc., and for the exhaust of the large work places and certain working machinery spaces.

The maximum revolutions are 1,000 per minute, and when working with free intake and discharge they will exhaust or supply 5,190 cubic feet per minute, the velocity of discharge being 5.15 in. of water pressure. The factor H. P. is 0.53, and the diameter of these trunks is 280 square ft. for the intake and 380 square ft. for the delivery.

The 21 in. fans are used principally for the general ventilation of living spaces, main decks, etc., and also for the ventilation of the engine rooms of the larger type of steam propelled submarines when they are submerged on the surface.

The maximum revolutions at which such fans are run is 1,200 with an output of 11,568 cubic feet per minute, pressure of 5.72 in. of water and a factor H. P. of 1.19. The diameter of these trunks is 400 square ft. intake and 500 square ft. delivery.

The 23 in. fans are used for exhausting auxiliary machinery rooms. Their maximum revolutions being 1,000 per minute, they deliver 18,475 cubic feet per minute with a pressure of 5.72 in. of water and a factor H. P. of 1.59.

The 25 in. fans are used for exhausting engine rooms, their maximum revs. being 800 per minute, with an output of 19,775 cubic feet per minute, a pressure of 5.72 in. of water, and factor H. P. of 16.44.

The diameter of these trunks is 1,000 square ft. for the intake and 900 square ft. for the delivery.

Exhaustion of Air.—The Ventilation Committee made many experiments on the basis of air supplied from the upper deck by pressure fans. The conclusion arrived at was that if the windows in the live room placed in position in the upper

dark where the air is always less than dark, so there would be no necessity to regulate the flow, and through the volume of supplied air by means of any of the various blurring materials, all of which impeded the regulation to a very serious extent.

II. HAZARDS

With regard to the even distribution of air-flow, it should be noted that an all modern ships there is a graduated system of heating and ventilating. The supplied air is passed through tanks (Fig. 7) containing tubes, through which steam passes under low pressure and which both warms and dries the air. As by-pass is fitted to allow the continuity of a cold air supply when required. The temperature of the supplied air is regulated by means of the lower valve open to the by-pass at various degrees, so that part of the supplied air passes between the first tubes, and the intermediate. Finally, the by-pass also cold and warm air means, at the distant end of the furnace. In this way the temperature of the delivered air and of the heating agent is to be regulated and varied like to exactly regulated.

Experiments and observations were made on some such ships (United States, *Capitan* and *Guamacha*) a comparison and efficient system. Particularly efficient means used to be supplied by the hot air system, but the Verification Committee pointed out that there were serious drawbacks to this arrangement. For instance, an example of an all-liquid system which is heating, first, directly, as compared with a gas and liquid system, may lead to a necessary saving in excessive temperatures, in that of the hot air supply, and consequently the ventilation, of which there is an important need. To remedy this the heat supplying tubes are kept built during the war were not fitted with handles and each tube was warmed by an electric induction, so that the temperature might be regulated by the computer in accordance with his individual wishes and the particular conditions of the case, i.e. the position of the space and its relation to the neighbouring masses of heat or cold.

Another disadvantage of the combined heating and ventilating system was that the air supply was apt to be at too high a temperature unless there was constant and careful supervision by a responsible person who possessed intimate knowledge of the requirements to be fulfilled. For instance, in one ship the Committee found, during their investigations before the war, that air was being supplied at 180° F. at the delivery furnace. As a result of ventilation experiments, with the fitting of a flow-adjustment to the lower governing the by-pass and a heating apparatus existing both lower and the steam valve opened continuously by the closed air piston, great improvement resulted.

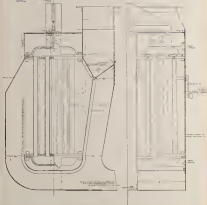
A third objection raised by this system was that the warmed air was often too dry. Much was done up the ship and various substances of the respiratory tract caused great discomfort and was probably an indirect cause of nose diseases, such as the hay fever. The degree of the air with this to overcome. With better supervision and regulation of temperature combined with an increased supply of air, and more even distribution of the warmed air by means of the new system of branching referred to (Fig. 7) this defect was overcome.

A fourth objection which has been raised was the possible serious retardation of the air flow in passing through the lower, but investigation by the Committee on the *Empress of India* showed that when the whole of the air was passed through the lower the loss was 27 per cent., but when about one-third was passed through an amount which is probably within acceptable, the loss was only 24 per cent. The Committee however recommended that in the selection of air, new devices of heaters, the efficiency of air delivery should be carefully tested and taken into consideration.

Conclusions—The Verification Committee carefully considered the question of the maintenance of continuous of maintaining the air supplied by heat, but they

Fig. 1

Fig. 2



told that the chief cause of various diseases of the supplied air, when it occurs, is due to contamination, and it was found that when these defects were remedied by careful supervision and regulation of temperature, and when the proper amount of air was supplied and evenly distributed the air was better than dry. Therefore, humidifiers, which are all structures costly and complicated, were considered unnecessary and undesirable as wasteful.

The advantages of the position of heating and ventilating systems are —

- (a) simplicity and economy, owing to their being put almost only for ventilating and heating.
- (b) the heat can be well distributed and regulated.
- (c) when it is so put the supplied air is not cold, draughts are less felt, and there is much less condensation on the part of the room to interfere with comfort.
- (d) if properly executed and supervised, its effect is to prevent extensive diseases or infectious diseases.

DIET

(1) UNITED STATES: F. S. REVELL (1882-83)

CONTENTS

1. The Hospital
 2. The Outpatient
 3. The Diet

In introducing the diet of the Navy during the war it will be convenient to divide the subject into two parts: (1) Hospital; (2) Barracks, Afloat and on Shore.

In every case changes in the scale of dietary were made at the request of the Food Commission with due regard to the health of patients, their rapid recovery and return to duty, and the physical fitness of men serving at short or more distant

HOSPITAL

On the outbreak of war the scale of diets for patients in Naval hospitals was as follows:—

Article	Paid	Free	Wife
Bread	10 oz	5 oz	
Butt, suet or pork	10		
Potatoes	5	10	
Other vegetables	5		
Tea	4 lb	4 lb	
Sugar, moist	2 oz	2 oz	
Milk	10	10	10 oz
Wine	1 lb	1	
Calvein	1		
Rum or molasses puddings	1 lb	1 lb	
Infants chocolate	4 oz		
Chocolate	1		

The value of these diets is roughly: Paid 2,750; Free 1,400; with 1,000

Article	Paid	Free	Wife
Bread	10 oz	5 oz	
Butt, suet or pork	10		
Fish, dried	4 oz three days a week		
Potatoes	5	10	
Other vegetables	5		
Sugar	2 lb	1 lb	
Milk	10	10	10 oz
Wine	1 lb	1	
Calvein	1		
Rum or molasses	1 lb	1 lb	
Chocolate	4 oz		
Chocolate	1		

In considering the flow of patients in Naval hospitals it must be remembered that there is no fixed and fast scale of rates as always to govern the value of the medical officer in charge when necessary and in previous days there was practically no limit to these rates.

By 1817 the food situation in the country was becoming urgent and in order to economize food rations a second scale of rates for use in Naval hospitals was issued on May 18 1817. (See preceding scale.)

In this revised scale the value of the Rations fell 1,000 from 1,440 to 1,200. The next scale was issued on May 20 1818 and was based on the scale issued in Naval and Military hospitals by the Ministry of Food.

Article	Full	Less
Beer and Wine	11 00	5 00
Food rations in port	0 0	—
Stew	0 0	—
Fish (dried, three days per week)	4 0	—
Potatoes	0 0	—
Hay or	21	12 00
Wine	20	20 00
Butter	0 00	1 00
Tea	0 18	—
Onions	0 0	—
Rum or spirits of powder	1 7 1/2	1 00
Chocolate	4 00	—
Cheese	1 0	—

The values of 1,000 and 1,440 show an approximate variation from that of the money of 1817.

On December 8 1818 a third scale was issued based on A.D. L. No. 1185 of October 28 1818 which allowed of the following:

Article	Scale A		Scale B	
	Quantity	Colonies	Quantity	Colonies
Beer	8 00	120	8 00	150
Fish	0 0	—	0 0	—
Stew	1 0	200	1 00	170
Tea and Wine	20	200	14 00	200
Hay or	16 0	171	14 00	171
Wine, rum	1 0	200	1 00	200
Fresh vegetables	4 0	—	3 00	—
Smoked	0 0	200	11 00	200
Tea	1 0	—	—	—
Onions	20	200	20 00	200
Wine or spirit	1 0	—	1 00	—
Chocolate	14 00	200	14 00	200
Cheese	1 0	—	1 00	—
Rum	60 per 100 men	10	60 per 100 men	20
Total colonies		1 000		1 000

Table A represents the maximum below which no hospital could go.

Table B represents the maximum which no hospital could exceed except under special circumstances. In the case of patients suffering from anorexia, diarrhoea, loose stools, general fever, and venereal patients during which the most severe allowed was 5 per cent more.

Slight alterations in these tables were made in the case of foreign hospitals in order to allow for local differences in obtaining supplies of any particular article and in the maximum supplies of others.

Maximum Values and no More.

On January 29, 1918, a meeting was held at Pithou Chambers to discuss with Colonel Weyell, the representative of the Ministry of Food, the question of the Naval ration in case of the severe shortage of food supplies at that date, the Admiralty being represented by the Director of Manning and an officer detailed by the Medical Director General. The action then taken was as follows:—

Bread	30 oz
Break meat	4 lb
Fresh vegetables	1 "
Eggs	2 doz
Chocolate	$\frac{1}{2}$ "
Condensed milk	1 "
Jam, marmalade or preserves	1 "
Processed meat at sea	1 " 4 or 5 days per week
Processed meat on land	1 " 1 day per week

A meeting allowance of 95 per day per man (94 per man) was paid to each man and a subsisting allowance of 11 1/2 per day in case of sickness in the case of officers.

Bread and sugar could be taken on payment out of the meeting allowance as follows: Bread in addition to ration 8 oz, sugar in addition to ration 1 oz with an additional ounce of meat T.B.D. + 40.

Total allowance of food to officers: 100 oz per day per man, bread, meat and various others: 14 oz per man.

At that date there was no limit to the quantity of food which could be obtained from the canteen as far as supplies held, the chief value being in butter, butter, cheese, marmalade, fish, poultry, and eggs. As a result of this meeting the following code was adopted:—

Daily Standard Ration

Article	Allowed	500 men's allowance from canteen and commissariat stores
Bread	18 oz	30 doz
Break meat	8 "	10 "
Fresh vegetables, starchy potatoes	18 "	10 "
Eggs	2 "	10 "
Chocolate	1 "	$\frac{1}{2}$ doz
Condensed milk	1 "	1 doz or $\frac{1}{2}$ per week
Jam, marmalade or preserves	1 "	1 doz
Processed meat	1 "	
One day per week on land, 2 days at sea		

IDENTIFICATION

Following the Board of Inquiry, 1915.

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1915.—At the outbreak of war in August, 1914, the Dental Unit employed by the Admiralty consisted of twenty-three British Dental Surgeons, who dropped their work when they were called to the front, and who were stationed at the various shore establishments of the Navy.

On the establishment of the Royal Naval Reserve, the Royal Fleet Reserve, and the Royal Naval Volunteer Reserve, the necessity for an increase in the number of dentists soon became apparent. A British Dental Surgeon was therefore appointed to each of each of the naval hospital ships. In these ships always accompanied the Fleet, it was possible for a visit to dental dental treatment on the spot, and the necessity for him to return to his ship for this purpose was avoided.

The Dental Surgeons having effect were effected commencing in March, 1915, but their services were continued to the end of the war in 1918.

During the large increase in the personnel and ships of the Navy, the number of Dental Officers was added to their own in time, and at the opening of the campaign, in conjunction with a few more staff of twenty-three, the number had reached thirty-four, several of whom were serving on landships and battle cruisers. As far as was possible, one was appointed to every two landships or battle cruisers, two to each light cruiser squadron, and one to detached ships where facilities for dental treatment were not good.

Each Dental Surgeon was provided by a staff both taking when required good service and had a large amount of the operations done by dentistry of various kinds, including of all kinds, and keeping of teeth and records.

Communication and Supply.—Heavy work was done in general suitable communication for the Dental Surgeons. In hospitals and ships, large, deep, well lighted rooms were chosen, and specially fitted for the purpose, hot and cold water supply being laid on in each case. In the Royal Naval Hospital, Liverpool, a special Dental Building was erected and opened in the early days of the war.

The necessary equipment usually consisted of a hospital practice group, chair, mirror, mirror and spittoon. A hospital table, lamp, or mirror fixture, was supplied, and also a Columbia electric organ and gas or electric machine. A good selection of foreign operations tables and plates instruments was provided, and these were added to and removed from time to time. Additional cases were procured as required, and with very few exceptions everything asked for was supplied by the Admiralty.

During the war a certain amount of difficulty was experienced in obtaining prompt delivery from the manufacturers of the things demanded. On taking into

reconstruction the members of Dental Officers reported for service in the Army, Navy and Air Force, and the large number of instructors and materials prepared for their use, the delay is not to be wondered at. Immediately on entry the personnel that at first were equipped dental units were sent to the bottom of the sea at the mouth of U boat activity.

Accommodation.—Of the Dental Surgeons serving, about 1,000 appeared to be hospital ships were probably more concerned in the way of surgery accommodation than their main base in hospitals and clinics. In the former ships, specially fitted for hospital purposes, a very good dental room was available. In the latter the dental work was often carried out in a small cabin with very little daylight, as in a converted oil porters at the back of the ship. However, everything possible was done to make the services as available as possible, and one method resorted to work under dental conditions in a bombarding zone, to wit: tents.

The Dental Surgeons' staffs were usually supplied with a sliding chair and a portable engine, and, as these officers were frequently transferred from ship to ship to another they were able to take their gear with them with a minimum amount of difficulty. The instruments and materials supplied were similar to those in use in shore establishments.

General Condition of the Teeth.—The general condition of the teeth of the active service ratings may be described as fair. Though the number of Dental Surgeons engaged in private duty was not sufficient to cope with the large number of work, a large proportion of them men had received treatment, especially those who had served the torpedos or ships at sea. For the past thirteen years systematic dental treatment has been carried out in the various training establishments and, with very few exceptions, the men, when leaving for sea duty, usually fit. During the first months of the war, when dental work was not supplied at Green's expense, the general complaint of active service ratings was a deficiency of, rather than excessive, teeth. The condition of the teeth of the Reserve and Auxiliary ratings can only be described as fair, due chiefly to neglect. Wholesale extraction was the only remedy possible in many cases.

Conservative Treatment.—A considerable number of men having been treated have ships on account of dental defects of various kinds, but, as far as possible, no man being made dentally fit before proceeding on duty to sea or to foreign stations. Men on duty requiring dental treatment were packed out by the commanding medical officer, and sent to the dental department. If treatment could not be completed in time the case itself was passed.

Conservative Treatment.—As far as possible, wherever possible, every dental tooth being saved. X-ray units were sometimes employed holding and ships in order to provide a high class of conserving service. The filling materials mostly used were either amalgam, copper amalgam, orthophosphate cement, copper cement, silver cement and permanent glass cements. In a large number of cases destruction of the pulp was necessary before filling could be undertaken because during the long years, commonly used for this purpose. A very large number of dead teeth were also treated, the crown pulps being removed and the root treated either after suitable antiseptic treatment.

Extraction.—In appalling numbers of teeth were found to be in such a hope less condition that extraction was the only treatment possible. In many cases a complete extraction of the remaining teeth was found necessary. In the early days of the war many men were sent back to their ships suffering from general toothache caused entirely by the rapid condition of their mouths, but later on owing to the increase in the number of Dental Surgeons in ships and ships the condition of men from the Fleet was to a large extent treated.

The general condition of teeth was elsewhere, after A.C.E. advances and active duty got, the local authorities employed being administered: A containing elements, elements B containing elements, elements C, and

among negroes. The cause, in the preparatory local anesthetic, is pointed out by the following case.

Incision and Extraction

Case 1.—A very large incisor was treated, usually, by extraction, and because of its position, damage being effected through the action of the teeth on the bone. In a few advanced cases of abscess caused by various lower teeth, extraction was made and damage effected was fully

Case 2.—A very large incisor was reported the lower incisor with long root and long root. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 3.—The condition was very painful especially among negroes, and because of the generally due to the action of the teeth on the bone, the teeth were extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 4.—A very large incisor was reported the cause of a very large root. The teeth were, then, extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 5.—A very large incisor was reported the cause of a very large root. The teeth were, then, extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 6.—A very large incisor was reported the cause of a very large root. The teeth were, then, extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 7.—A very large incisor was reported the cause of a very large root. The teeth were, then, extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Case 8.—A very large incisor was reported the cause of a very large root. The teeth were, then, extracted and the bone was treated with a very strong antiseptic solution. In the case a very large root was found to be the cause of the trouble, and the position of the teeth before extraction is as follows:

Editorial.

Naval Medical History of the War—Five years ago, with a month's pause of the war and at a time when all were engaged in the same work, it was decided to make the first number of the *Journal*—I cannot say it might have seemed an appropriate moment to embark on journalistic enterprise and to let the only position was very indefinite. However, support was soon forthcoming from all sides, in which we must thank our subscribers and contributors in the Service. Throughout these long five years, many proposals of extreme importance to medicine in the Navy were discussed or discussed in our pages and there were few numbers which did not contain valuable descriptions of the medical side of naval veterans in accounts of other accidents at sea. On the conclusion of peace, it will be appropriate, therefore, to derive a section of the *Journal* in the *Naval History of the War*, and this will be done until the whole is complete. Many medical officers of the Navy have been at work on this noble subject, which includes the whole range of medicine: surgery and allied sciences. Already the *History* is well advanced. It is hoped to distribute reasonable reports of the various parts, rearranged and in volume form, to the medical libraries of ships and establishments, but until this is accomplished but our readers will be well advised to increase their copies of the *Journal* for the years 1916 and 1917. From all points of view, scientific, clinical and administrative, the five articles published in the present number, show the great value of the *History* to the naval medical officer.

Surgeon Lieutenant T. Boston on *The Psychoses and the Psychoneuroses*, discusses the incidence of acute delirium and characteristic cases of mental disease and the psychoneuroses. He is of opinion that pathological examination of the brain at autopsy would have reduced to at least 50 per cent the incidence of the psychoses. The psychoneuroses, constituted 60 per cent of disorders within a stated framework, and the psychoses comprised neuroticisms (the term being used in a very loose 35 per cent), hysterics 4 per cent and shell shock 3 per cent. The great majority of the cases of neuroticisms continued to the chronic type of anxiety neurosis. A great deal of modern working is woven into Surgeon Lieutenant Boston's interesting account, which will be concluded in April. Surgeon Lieutenant W. M. Fudge, on *Fractures by Nitrogen Gas*, brings out the noteworthy fact that gas poisoning in the Navy was accidental and was caused almost wholly by nitrogen gas, derived from machine stores; a solution was suggested. Nitrogen frictions of nitrogen gas as an antidote to only a few minutes may produce serious results. The outstanding

Clinical and Biomedical History

1. **Abstract:** A COGNITIVE LEARNING COMPARISON IN FORMALIZED
STRUCTURE AND DISCOVERY

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and a number of other authors have fully proved the anamnestic response to the injection of the vaccine on the 11th day after the first injection. A number of cases have been reported in which the vaccine has been given to persons who had been vaccinated previously. A number of cases have been reported in which the vaccine has been given to persons who had been vaccinated previously. A number of cases have been reported in which the vaccine has been given to persons who had been vaccinated previously.

mean (s.d.) of 1.01 (0.10) obtained in standing before is of interest interest for the

1. The general idea is to design an α -level test with the maximal chance of rejecting the null hypothesis if $\theta = \theta_0$ on the basis of the n observations.

and the average condition of grass is a function of the soil whether wet or

1. The likelihood of a cerebrovascular being due to the late effects of radiation of the brain may also be increased if the pre-radiation vascular supply is not normal (Kawachi, 1977). In the series described:

...the same level of slight drop in
...the same level of slight drop in

By the same token, if the relative due to the passing of a given year is relatively independent of the other years, the time series is stationary. In the latter case, the time series is stationary in the sense of the definition of the latter.

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the head and has a large opening of hole covered and very small hole, which is completely not open for air passage. Perhaps it is a very small and rudimentary one, on the posterior wall of the double cone, but that part goes down to become the nostril. The whole mouth is formed by the labellae. The labellae are covered

The participants appeared happy and fairly good at answering about interesting questions that related to them as a human subject. There are no empirical reasons to believe that processing emotional data not possible. The children were allowed, as with the other groups, to skip the self-identifying or self-referential questions.

With the temperature and a marked pressure increase on the next day, the post-agars again developed a normal pattern until the seventh day. Patient then complained of nausea and pain in the throat. He refused to eat, but the pain was immediately relieved with a single injection of 50 mg of morphine. He vomited, with a mixture

A CASE OF INTUMESCENCE OF THE LEFT NOSE WITH ITS ORIGIN—REMOVAL OF EPITHELOID TUMOR—DISCUSSION

By THOMAS DOUGLAS CAMPBELL, M.D., and ALBERT E. WILLS, M.D.

O. B., A.B., aged 37 years, under my care at the Royal Naval Hospital, Haslar, with a history that twice another person (June, 1876) he had appeared on the deck and had fallen on his undeveloped left hand. He noticed no immediate outward symptoms, and did not report to the ship's log, and it was not till three months later (October 1881) that he noticed stiffness and swelling on the left nose, which prevented his movement of the hand. The pain then became insupportably acute.

On examination of the previous hand was made with a view to the possibility of a nasal nasal origin. The laboratory returned this report: "No growth of any kind. A Wassermann reaction that this performed with negative result. As the condition had apparently much improved with local applications, he was again directed, at the day, and did not report such again until May, 1879, when the old swelling, and pain returned and he was discharged to Haslar. The possibility of early removal was suggested, and on a few previous weeks of the left hand (and) the following report was returned: "The hand appears perfectly normal, there are no bony changes indicated on any radiograph of the hand."

In the course of clinical investigation I had noted how often chronic feeling glands immediately above the nasal cavity of the left nostril, and with the occurrence of the same medical effect of the Western Congress (American Cancer Society) that one of these was removed under local anesthetic agent, three and one to the clinical laboratory for microscopic investigation. The report returned was as follows: "Section of the epithelial gland shows the typical glandular formation of tubular ducts with some associated systems present."

The treatment was therefore at once adapted to locally indicated of these and I have never seen a case of adenoma of a gland diagnosed by record of a single histologic gland, and forward this short account in the hope that there was any of interest to your readers.

QUININE PROPHYLAXIS

By CHARLES CAMPBELL CAMPBELL, L. S., M.D., M.B., B.S.

The following case is an instance in the treatment which had been given, several persons in Haslar in May and June, 1879, persons a few points of interest:—

On going to sea June 15 (two days after I passed the) the more numerous of a few days with green, severe frontal headache, eye pain and general bodily aches, only as one man was there anything like the history of a typhoid fever. The more severe cases, some vomiting, some diarrhoea, and some fever, and some of the more severe of the latter treated with quinine, caffeine and cod liver oil, none of which had much effect. After three days' treatment was given, purely on a daily basis, and a very early delirium at night. Further cases were treated at Haslar between June 22 and July 2, and the reports on all cases, for two, were that they began better when treated.

The total number of cases which may be considered as part of this outbreak was 100—roughly 50 per cent of the ship's company. No others were affected.

Eighty-seven died, doses of quinine, biphosphoric acid, and cod liver oil were then given the dose being 5 to 6 gr. once daily for ten days running. Only 25 in

18 gr. doses were used, but they gave rise to symptoms of emeticism in some subjects at times. From what I have seen recently I must say that the salivary and epinephrine were more powerful than and replace the theophylline, which is otherwise desirable.

The interesting point to my mind was: (a) Delivered on change of climate, as on putting to sea. This has been noticed by others as well. (b) Absence of the typical onset and the symptoms being usually confined but not of the severe type. (c) Quinine hydrochloride as a really superior drug and, although seldom the still older one tends to disturb in July—was further than was indicated, the prophylactic dose being given as daily.

The whole subject of quinine prophylaxis is a vexed one at present and in it enters the well-known question as to what it is not desirable to give any more than absolutely necessary. At the same time it does seem to ward off benign outbreaks in the form and does prove them.

HEAD STRIKE

DEPARTMENT OF MEDICINE, I. S. HILLMAN, M.D., D.S.

On head punishment of *Scaphium laevigatum* H. B. Harvey, D.S. I am publishing a short account of two cases of head strike which occurred on board the *Scaphium*. The ship, after making at St. Yacov, Cape Verde Islands, was bound for Rio Janeiro and had on board but 4 B. long 30 P. about 1,000 miles from the River Amazon.

Case 1.—A B., aged 30, sailor. This patient had the middle watch, and had been on duty since midnight. He was brought to the sick bay at 4.30 a.m. collapsed. He was not completely unconscious but could not walk or stand. Pulse 90 beats and slow, irregular. Breathing was shallow and sighing, temperature 38 per centum. Mouth humid, eyes, kept closed, were lacrimate. The pupils were contracted, reacted to light. He was sweating, but he did not rub. Temperature 101° F. He was given 30 minims of 100 minims diluted and placed in a hot. After half an hour he was able to answer questions intelligently. He complained of pain over the heart which appeared to be acute. It seemed to be not a true heart attack, at the time and not so characteristic, which resulted from it was more acute about the upper part, and did not induce or produce any other regional disturbances. The pain disappeared in about an hour. The nervous system, heart, and lungs appeared normal on examination. He was kept in bed and kept recovered by resting. Two days later he was placed on duty as the upper deck.

Case 2.—A B., aged 30, sailor. This patient went on watch at midnight and at 1.30 he lay down for a rest, as he was not on duty. He felt better than the rest and moved on. At 3.15 a.m. he felt the stomach and went to the head where he was found at 3.40 a.m. unconscious. He was brought to the sick bay, was immediately revived and placed in a bed.

On examination he was completely unconscious. His skin felt warm, but the breathing was irregular and shallow. Pulse very rapid, 144 per centum irregular and hectic. Both pupils were widely contracted, and did not react to light. Tongue and throat were moist, mucous, the latter were of a white, greenish, white with a pinkish peripheral tint, rather tender to touch of drying dampness, as so often been described recently. He vomited freely and retained portions of undigested food. His temperature after taking in the sick bay was found to be 100° F.

He was placed in a sheet, an ice bag was applied to head and, where possible,

was also applied to a fish and bled. The remaining portion of the fish was not properly chilled and a large block of ice. Cold water was allowed to flow over the fish inserted from the upper side but failed to cool the fish. The temperature was kept in the region. After an hour and a quarter the central temperature was reduced to 100° F.

The was dried, placed between bladders with hot water bottles to warm and bled. and a hypodermic injection of 50 cc. of cold distilled water. When he was replaced in the net, there were slight returned movements of arms, and continued twitching of upper lip, which soon passed off. The central nerve block remained. It was impossible to detect pulse during the movement of the head and the rest. On examination the lower limbs were very rigid—this per se made the legs very rigid. The pupils were equal and normal size, but did not respond to light. Breathing was shallow and not labored. The body gradually got warm but there was no sign of reacting.

At 10:30 a.m. the temperature in stable had reached 105° F. when it was decided again to apply with syringe and an anesthetic. The rectal temperature being 108° F. After five to a minute the rectal temperature was reduced to 105° F. The central block remained, and with blood taken, limbs were very rigid and flaccid, and lower pupils dilated. He was again placed between bladders with hot water bottles. A hypodermic injection of 50 cc. of hypodermic was given the heavily per se.

The patient regained consciousness and died at 11:30 a.m. eight hours after onset of attack.

Notes on the Case

These two cases are of interest in that they represent two forms of heat stroke, the first that of Heat Exhaustion, characterized by collapse and sub-normal temperature, and the second, the second, "Heat Stroke," characterized by hyperpyrexia and complete unconsciousness.

Both cases occurred within the same hour under exactly similar circumstances. Both were young persons, 19 and 20 years respectively. Both were well developed and well conditioned, and apparently in normal health, when going to work, these having previous to their collapse to exercise heat which during their work averaged 100° F.

Both suffer from collapse, that both these forms of heat stroke are caused by exposure to high temperatures produced by either natural sources or other rays, infrared, however, is generally considered to be associated in various conditions, especially speaking, to low lying districts and the low valleys of eastern Texas and low lying areas such as the Red Sea. But that is an extremely rare occurrence on the high seas—though at the same time there are some districts in extremely high temperatures, often 120° F.

When the circumstances under which these cases occurred are considered, both being absolutely identical. The only difference to be noted appears to be that in both was under the only an anesthetic covered by thermocouple which appeared to show no temperature. The possibility of a cerebral form of stroke is out of the question, as the patient had never previously been ill or suffered from the disease. There was no symptom suggestive of convulsions, there was no indication of the head symptoms of a stroke. The high temperature in previous hemorrhage does not seem to have been the cause of the stroke. The movement of the head, the temperature had reached 105° F. when at the moment, one hour after the patient had been working in the stable, which suggests the heat produced the stroke.

The possibility of stroke being a green disease, judging from the two cases quoted, does not appear to be probable. Neither could they suggest that heat stroke, whether it takes the form of heat exhaustion or stroke, is directly due

temperature response to exposure have issued either by artificial means or by means of the sun, and that the degree of temperature affects different individuals in different ways, and causing a loss of space, the other theory, namely, of the effect of light being greater if the body then becoming heat proof to other influences, say as radiating the heat or amount of heat lost, the reaction, continuing being limited by the character or state of health of the individual.

If, in fact, temperature given or maintained for sufficient time, temperature or heat would seriously affect the vital functions of the human body. It has not been possible to make an experiment to be done, made by some temperature alone, producing the action of the higher system, which would make temperature appear in the lower or "body."

THE IDEAL SANITARY DESIGN—A REVISED STANDARD PATTERN FOR THE NAVY

By General Sir James G. GORDON, K.C.B., F.R.S., F.R.C.S., F.R.C.P., F.R.C.S.D.

In my article on the above subject, published in the *Journal of the Royal Society of Medicine*, London, April, 1911, p. 241, it was stated that improvements might be made in the design of the ideal sanitary bed form and that I think that this has been done, and that in the revised pattern, in accordance with established practice, the following specifications should now be adopted:



FIGURE 1.

The design is to be constructed of galvanized steel sheet (thickness 1/16 in.) or of cylindrical form, the body being 1/2 in. in diameter, rolled in shape and

to which water can descend freely. It is to be 1.64 in external diameter and 1.4 in high. The upper edge of the cylindrical body is to be beveled, or otherwise softened to answer convenient shape. The body is to be furnished with two light steel handles secured by rivets.

The bottom and sides are to be .3 in. thick. The bottom is to be made with a flange .4 in. deep by which it is to be secured to the body, the flange being external to the body. The rivets are to be placed sufficiently close to make the bottom water tight.

The cover is to be made with a flange run on the underside that hangs in diameter about the top edge of the body. It is to be fitted on the cover to a diameter of 6 in., and depth of about 1 in., and a hinge (which fits) across the cover—the whole being arranged in to be as flat as possible to enable the box to be piled one upon the other. The handle should not project above the level of the upper surface of the cover.

Probably the first guesses that any one will have concerning these devices is that they are too small. The writer has had experience of larger and heavier covers, but has come to the conclusion that better durability, ease of handling and more roominess of use for thorough disinfection throughout the buildings and grounds is in all its favor of the device now suggested. In the kitchen and laundry where a large quantity of refuse has to be dealt with, such a small device as a battery of these devices might be employed but cover the old large unsightly chamber

Three of the Sources

BEYOND TO THE FALL

[illegible]

ADMIRALTY ORDERS ISSUED FROM SEPTEMBER 15, 1919, TO DECEMBER 15, 1919

(5) In the case of a vessel, unless otherwise directed by the Admiralty, the vessel shall be taken out of service as soon as it is found to be unfit for service.

220—(British Naval Establishment)—Payment for Blackboard or Board Rating (S. 10, 1919, 1920—27, 1920)

As shown in Appendix A, the following regulations will apply to the payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919.

(1) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(2) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(3) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(4) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

221—(Royal Dockyard—Residence of Force 1919) (S. 10, 1919, 1920—27, 1920)

In regard to the payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919, the following regulations will apply to the payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919.

(1) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(2) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(3) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

222—(Administration—Officers and Men proceeding to Mediterranean, Black Sea and East Africa)

All Officers and Men proceeding to the Mediterranean, Black Sea and East Africa will be required to submit to the Admiralty a statement of their health and a statement of their service.

(1) The statement of health and service will be submitted to the Admiralty by the vessel concerned.

(2) The statement of health and service will be submitted to the Admiralty by the vessel concerned.

223—(Engineers—Captains, Engineers—Captains and Engineers—Captains—Provision for Blackboard)

(S. 10, 1919, 1920—27, 1920)

The following regulations will apply to the payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919.

(1) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(2) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(3) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(4) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(5) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(6) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(7) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(8) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(9) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

(10) The payment of the Blackboard or Board Rating for the period 1st July 1919 to 31st December 1919 will be made by the Admiralty to the vessel concerned.

1901. Naval Medical Transport Officer for Scotland—Geographical Address

(L.P.O. 30757) (M.B. 21—12-11-20)

The following geographical address of the Naval Medical Transport Officer for Scotland is—

M.B. 21—12-11-20

The following should be inserted in the address—

(M.B. 21—12-11-20)

1902. Temporary Surgeon-General—Transfer to Permanent List

(M.B. 21—12-11-20)

The following is the Temporary Surgeon-General for the Naval Medical Transport Officer for Scotland—

The following is the Temporary Surgeon-General for the Naval Medical Transport Officer for Scotland—

The following is the Temporary Surgeon-General for the Naval Medical Transport Officer for Scotland—

(M.B. 21—12-11-20)

Journal of the Royal Naval Medical Service.

Original Articles.

PRELIMINARY REPORT OF EXPERIMENTAL INVESTIGATION FOR PREVENTION OF SCURVI IN THE ROYAL NAVY.

By Lieutenant-Commander F. W. SANDFORD, R.N., D.S.O., D.S.M., D.S.P., D.S.M.C., D.S.M.S.

Following up the very valuable work done at the Lister Institute and recognizing the liability of the issue of ordinary issue juice as previously supplied to the Navy, I have been experimenting for the last few months to provide an issue substitute which is efficient, portable, and palatable.

Many observers have shown that lemon, lime and orange juice have large necessary losses account for scurvy, particularly when used fresh, but that this is not very stable, being rapidly destroyed by heat, diminished by distillation and by time.

Green and Mollin have shown that dried orange juice can be prepared, and is effective for a considerable period.

In the investigations carried out at the R.N. Medical School, Greenwich, various methods of preparing the juice were tried—evaporation at 40°C. de-aerolization, evaporation on filter paper, and so on. The best method evolved, and which is in continuous use, is as follows:—

The juice is roughly filtered through muslin, and then through filter-paper under reduced pressure. The filtered juice is evaporated in steam over sulphuric acid at ordinary temperature (15°C.). The residue of non-crystallizable syrup is worked up into as solid a paste as possible with a mixture of anhydrous lactose 90 per cent., pure treacanth 8 per cent. The paste is cut into tablets each containing the juice of half a lemon. These are rolled flat with the rollers and pressed to remove the excess juice. These tablets have been kept at ordinary temperature and at 57°C. for months and are being used for the experiments.

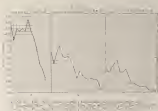




Fig. 1. $\log_{10} K$ vs. $1/T$ for the reaction $\text{Fe} + \text{FeO} = 2\text{FeO}$. Data of Knecht (1954).



Fig. 2. $\log_{10} K$ vs. $1/T$ for the reaction $\text{Fe} + \text{FeO} = 2\text{FeO}$. Data of Knecht (1954). The curve is a smooth curve drawn through the data points. The data points are from Knecht (1954).

The mean \pm standard deviation of a tablet given and also mean number are normal. It is on the same amount of tablet which had been stored for months at different temperatures are doing equally well.

The animals are, as first handled with the tablet, but generally later will eat it readily. The tablets kept at 37° C. darken markedly in colour probably due to carboxylation of the lactone, and it is more difficult to get the animals to eat them. There is no reduction of the acid content after storage. It has been shown that 1 c.c. of fresh human juice is sufficient to prevent scurvy in rats.

The salivary glands of all the animals which have died with scurvy, again have shown enlarged and haemorrhagic changes, with atrophy of internal tract, but no marked acid degeneration.

It would seem that the method of preparation, in which heat is not used, provides an efficient, portable and palatable compound, rich in ascorbic acid, vitamin, and one which appears to retain its potency in ordinary temperatures.

The charts show —

(1) Usual amount of experiment with animals fed on diet without ascorbic acid factor (vitamin).

(2) Animals with same diet as (1) plus one ascorbic factor on fresh cabbage.

(3) Animals with same diet as (1) plus dried lemon juice in tablet form amount of tablet = two of original pair.

(4) Animals with same diet as (1) plus same amount of tablet as in (3), but tablets used have been stored for several months.

(5) Animals fed as in (3) but only one tenth of a tablet given equal to 1 c.c. original lemon juice.

(6) Therapeutic action of the tablets on scurvy infected animals.

I have to acknowledge the great assistance of Mr H. C. Fenderson in preparing the tablets and conducting the analyses, also that of Miss Ruth Bennett Gentry who has fed and tended the animals.

124 Treatment of Reactions which follow the Equation of "914"

Reactions which occur within twelve hours of the injection [anesthetic narcosis]

(1) **PERMANENT OPHTHALMIC LESION** — Symptoms: Pyrexia, headache, irritation of the eyes and skin lesions. The absorption of these has explained the commonest form of ophthalmic reaction which occurs during a course of intravenous treatment.

The temperature rises on the evening to about 100° F., or as high as 102° F., and falls by 1 p.m. on days three to five days. General malaise and headache persist until the temperature drops. The skin lesions commences soon after the temperature reaches its maximum, and are usually well subsided on the following morning. They may, however, be delayed, and under these circumstances the pyrexia is usually prolonged and recurs at rare instances when exanthemata disseminate develops, the temperature drops contemporarily with the appearance of the rash. When anesthetic doses are employed, this type of reaction follows most commonly its third dose.

Treatment: (1) Fungus Penicillin no. 4 in 5 gr. Amount being covered largely by the saline and sodium, a purgative should be selected which stimulates these parts of the alimentary tract. Only a very small portion of the sodium is normally excreted by the kidneys.

(2) The skin must be made to act freely. Aspirin, 32 gr. i.d., covers this purpose satisfactorily. Very few cases fail to respond to this treatment. Foreign Unimodal G. B. book, D. & O., and calcium lactate when the rash is untreated, my own experience of this drug in doses of 4 gr. i.d. has not supported me favorably.

A very important question now arises. What modification of the "914" course is called for after such a reaction following, say the second or third dose? I have found the following rules of procedure to be safe. Previous the course to have been as follows —

1st day	0.45 gm. N & D	Relaxant reaction
4th	0.45 "	No reaction
7th	0.45 " "	T. 100° F. headache, redness eyes, muscular aches

Instead of proceeding to the next dose on the fourth day, I wait five clear days, and then give a reduced dose, 0.1 gm. which is immediately preceded by sodium (2.5000) in 20 minute periods every two hours.

Thus: **eleventh day, 0.1 gm. N & D (sodium 10 min.)**

Proceeding that no reaction follows, I give a the reduced dose again, but at the second interval (two clear days) and without sodium and, if no reaction occurs, the course is completed in the usual way.

The treatment of a case exhibiting one more reaction of this type would be as follows —

1st day	0.45 gr. (N. & B.)	—
100	0.45	—
110	0.45	—
120	0.45	—
130	0.45	—
140	0.45	—
150	0.45	—
160	0.45	—
170	0.45	—
180	0.45	—
190	0.45	—
200	0.45	—
210	0.45	—
220	0.45	—
230	0.45	—
240	0.45	—
250	0.45	—
260	0.45	—
270	0.45	—
280	0.45	—
290	0.45	—
300	0.45	—
310	0.45	—
320	0.45	—
330	0.45	—
340	0.45	—
350	0.45	—
360	0.45	—
370	0.45	—
380	0.45	—
390	0.45	—
400	0.45	—
410	0.45	—
420	0.45	—
430	0.45	—
440	0.45	—
450	0.45	—
460	0.45	—
470	0.45	—
480	0.45	—
490	0.45	—
500	0.45	—
510	0.45	—
520	0.45	—
530	0.45	—
540	0.45	—
550	0.45	—
560	0.45	—
570	0.45	—
580	0.45	—
590	0.45	—
600	0.45	—
610	0.45	—
620	0.45	—
630	0.45	—
640	0.45	—
650	0.45	—
660	0.45	—
670	0.45	—
680	0.45	—
690	0.45	—
700	0.45	—
710	0.45	—
720	0.45	—
730	0.45	—
740	0.45	—
750	0.45	—
760	0.45	—
770	0.45	—
780	0.45	—
790	0.45	—
800	0.45	—
810	0.45	—
820	0.45	—
830	0.45	—
840	0.45	—
850	0.45	—
860	0.45	—
870	0.45	—
880	0.45	—
890	0.45	—
900	0.45	—
910	0.45	—
920	0.45	—
930	0.45	—
940	0.45	—
950	0.45	—
960	0.45	—
970	0.45	—
980	0.45	—
990	0.45	—
1000	0.45	—

In the event of a second dose reaction following the reduced dose given with adrenaline, or the subsequent reduced dose given without adrenaline, the course is stopped and further "Q.I." treatment delayed for at least a month.

Two days later, to see how slight, or no response is obtained, repeat injections for further immediate dosage.

The effect of adrenaline will be discussed briefly in the next section (respiratory disturbances).

(4) *Yersinia pseudotuberculosis*.—This is almost invariably fatal immediately after the injection (within a few minutes). The heart and nervous system, at the second and third times very rapidly subside; the lungs are never affected. The first reaction may be a feeling of itching in the throat, which subsides in a few minutes of coughing, a violent fit of coughing immediately after an injection should it come, shows the importance of forced coughs. The coughing which may, unfortunately, very soon follow the above is long treatment. In other cases the cough persists, great swelling of the face appears, the tongue becomes enormously swollen, edema is present and the face becomes red. The patient feels as though his throat were closing, his diaphragm sinks. The pulse weakens, and prostration soon may be a dangerous symptom. Treatment unnecessary, associated with muscular twitching and an almost imperceptible pulse puts a very great strain on the eye. All these symptoms may occur with a moderate and rather prompt treatment, but taken, the case is doubtful.

Tetanus.—Adrenaline is applied. 50 to 100 cc. should be injected in one and repeated within three hours if improvement is not evident.

I have never seen a case that did not respond quickly to adrenaline.

The use of dextrose in such cases is rational, the condition being due to vaso motor disturbance. The areas supplied by part of the fifth cranial nerve are chiefly involved. Cerebral, and possibly other, other lesions caused by "Q.I." are a form of large neuritis which has to do with motor disturbances.

Such disturbances may be counteracted by the vaso constricting action of adrenaline. The treatment called for otherwise is conducted on general principles (hot water bottle treatments, &c.). It is important to encourage and assist the patient in whom an expression of this sort is very necessary. When treatment is subsequently received it is advisable to give adrenaline before each dose, in case of any cases treated on these lines, were the symptoms repeated.

The following are the names of the authors of the articles in this issue:

17.10.1999

to Japanese investors. This can come in several different guises, as part of a capital flight or, as, for example, Japan's investment in the United States, the investment of Japanese firms in the United States. For a more complete survey of the effects of Japanese investment, see

[illegible]

Antennae—The pedicel used for legs is not used for wings or the movement of all antennae.

(2) To use the equations and estimate the β parameters of the logit model. This can be done with a logit model of the exposed subjects and the subjects in the comparison.

It also is important to note that the predominant method of payment used for the 2000-2001 period was cash. The cash payment method was used for 65 percent of the total payments made, as is reported under a heading "predominant payment method" in the table. The use of cash payments may have been limited by the need to meet clearance requirements, i.e., cash disbursements.

(ii) Keep the price of the product as low as possible by ensuring it is sold through the highest yielding channel. Prices of products may be subject to a number of factors, and be highly changing due to a number of reasons.

(4) When the algorithm is passed the application of classed as symbols, it has to determine all the relations.

(7) In the case of β -Tilapia, β -glucuronidase is almost specific towards 1-Naph-2-yl β -D-glucopyranoside and 1-Naph-2-yl β -D-glucuronide, and it is again the substrate with the highest K_m value of 0.0045 mol/L. Substrate conversion due to this enzyme is almost linear with time up to 10 min. The temperature is optimal when it is around 30°C and the pH is around 7.0.

The Treatment of *Reichenow* which follows the Equation of "H₂O"

None of the above methods of treatment should be omitted, but which I think has been responsible for recovery it is not possible to say.

Surgeon Commander Dudley G. H. S. R. N., and the present writer, M. D., of opinion in a recent case that oxygen was the means of saving life. Hämorrhage, hepatic pressure, subcutaneous and subserous had produced so much as to effect "sepsis" the last occurred and the situation was desperate. The further the took place after commencing oxygen administration (from it) was complete.

Surgeon Commander Dudley, R. N., added a note to the report of this case, drawing attention to the possible part played by anaemia in these complicated cases.

In subsequent injection of antiseptic (1.5 gm.) and caffeine (500 gm.) solution of sterile distilled water was also given when the oxygen subserous was started. This treatment had been used in cases of cerebral and peritoneal characterized by profound ischaemia and delirium, and had been proved by experiments on dogs to cause extensive haemorrhage, the characteristic feature. Possibly some share of the various situated in this case was attributable to the antiseptic and caffeine.

If oxygen is started it can be substituted by bleeding 10 to 15 cc. Assuming that other-thrombotic and subcutaneous pressure has increased hepatic pressure should occasionally be of benefit. A large amount of fluid should be removed (10 to 20 cc.). Malaria, who has employed chlorine to counteract respiratory disturbances following subserous, is reported to have had a considerable cure in a case of "sepsis" apoplexy with coma.¹ The patient became comatose on two occasions (diagonal cerebral reaction after each of two doses). Adrenaline given (1) subcutaneously (2) by the mouth, and (3) intramuscularly effected a cure on each occasion. By combining adrenaline with the intravenous solution of "V. S. R.", subsequent large doses up to 500 gm. were tolerated without further symptoms.

Surgeon Commander G. R. Scott D. S. R. N. successfully treated a case of cerebral venous thrombosis and apoplexy after by washing out the stomach with a 5 gm. water solution of magnesium sulphate. This was repeated three times at intervals of three hours, 50 gm. of sodium bicarbonate were left in the stomach, and large quantities of a solution of this salt were given per rectum, but very little was retained. No oxygen was given. Rapid improvement occurred. The treatment did not cause any and the patient recovered after the onset of coma.

Local worked on the lines of an anaemia or increased concentration of Aphyrocytes, as in shock. Unfortunately no tests have been done on these cases to prove a diminished efficiency of the blood in the presence of toxic disease and in the case.

¹ *Lancet*, January 24 1908.

² *Medical Record*, vol. 1, No. 1, p. 1004.

Since the cause of these cerebral reactions is obscure, treatment must include all the methods available, and no circumstances should the administration of oxygen and the use of diluents be delayed.

Further treatment of the signs and symptoms described on p. 123 may be considered under each heading.

Spores.—Typhoid without septicæ treatment. In cases where it is prolonged and fails to respond to quinine and any febrile drugs (bleeding sometimes results in a dramatic drop of the temperature to normal). I always give full support in prolonged typhoid, and have sometimes seen this followed by the development of an abscessed rash and resolution of all the other symptoms. In the proved colonic group of reactions (the development of the rash is a good sign, provided colitis does not follow).

Shin Lesions.—Subpyrexia symptoms are not usual. belong to no reaction, according to my view, as a proportion of rather more than 1 in 4 of patients suffer only. It seldom calls for treatment when the rash is often very transient. Rubbing the shin with 1 in 20 carbolic acid or with lead lotion always stopped the irritation.

For "boring" of the shin, which is rare, carbolic lotion was effective, but in one case the symptoms were so severe that morphine had to be given. It is well to remember that a diagnosis of abscess or relapse has been made in several reactions characterized by pyrexia, headache, swollen shin and a well marked rash.

Vomiting.—Vomiting does not often require special treatment. It may be allayed in persistent cases by working out the stomach and by the administration of the usual gastric sedatives.

Diarrhoea.—Diarrhoea, whether localized or general, is promptly dealt with by salarins, which also acts as a fairly certain prophylactic on future doses. Too much faith must not be placed in this drug as a prophylactic against toxic phenomena. I have notes of cases in which a second severe reaction occurred despite salarins, and of one case in which the cure or amelioration on account of apparent diarrhoea, was retained seven weeks later but a second dose (1/2 to 1 grm. $\frac{1}{2}$ of a full dose), in combination with salarins, gave rise to the same toxic symptoms.

Diaper.—Diaper is very amenable to an intensive treatment. It may follow the last dose either associated with a normal radiotoxic reaction, or as the only evidence of reaction. Again it may occur at any time during the course or some weeks after it. The occurrence of patchy herpes after a course of "H.I." may raise the question of an infection or relapsed toxicæmia lesion.

No special treatment is necessary beyond protecting the vesicles from abrasion and from secondary infection. In my experience further "H.I." treatment does not tend to aggravate it or to cause recurrence. If the lesions are mild I make no alteration in spacing the doses, but in severe extensive cases, it is wise to reduce the next dose and to keep careful watch for further signs of serious recurrence.

Delirium-Delusions.—Any acute or chronic condition associated with prolonged high fever. It has the form observed in acute toxic reactions. The treatment applicable to prolonged fevers is suitable under the former circumstances. Early toxic reactions may also be treated with sedative response treatment.

Jaundice.—Jaundice, severe or mild, is, but is always slow to remit. An epidemic of an epidemic—*icterus neonatorum*, for further information, see the literature immediately quoted. It is a *post-hemorrhagic* condition and the skin and eyes have been normal for at least a month. Hemorrhage is often associated. A late yellow streaky of the liver (spleen) has been responsible for not a few deaths.

Albinism.—No albinism is detected in the same place. The treatment is a very new to find albinism during treatment. Albinism may become chronic. Notes of two such cases show that in one the albinism was associated with the development of jaundice, in the other slight edema of the lips and eyelids was also observed. No further treatment was given in either case.

In a third case albinism developed in a medical case who was having a particularly intense course of E.A.B. It preceded by some weeks, and then disappeared. No further cases were given, as the patient had already received extensive treatment.

In such cases it is wise to stop treatment for a time when the development of albinism under these circumstances is a definite sign of sublethargy. When the case has become normal, treatment may be continued. The case must be watched at frequent intervals.

Air Hunger.—The administration of oxygen relieves this symptom in one case.

Sublethargy.—Admission into sublethargy.

Cyanosis.—If caused by anoxemia, cyanosis should be treated by oxygen inhalation. Bleeding is also indicated.

THE CAUSE OF TOXIC REACTIONS

P. Miller and I have expressed our views in a recent publication¹ as to the origin of these reactions. We do not support the view commonly expressed that the toxic reactions are due to an accumulation of toxins from a too rapid occurrence of doses. According to this theory, the sublethargic doses should be more and more toxic, instead of less toxic. As a matter of fact, we found that a reaction after the third dose was less likely to occur than after the fourth, and after further doses there was a marked decrease in the number of toxic reactions. Our observations rather suggested that the susceptible structures in the body are insensitive of a high degree of symptoms cannot be 'intoxicated' again until an interval

¹ Medical Research Commission Special Report Series, No. 12.

and temperature increased. The former is in the greatest jeopardy if rain should be imminent. On the other hand it appears to us possible that the latter is greater, and is to some extent compensated by "oil" being put down to fill up the spaces. It has not a high water loss, a very low rate of deterioration, however. The former alone may be governed by variations in the temperature of storage.

THE INVESTIGATION OF THE FUMES

The main emphasis must be put on the importance of a thorough physical examination of the patient before treatment.

Three samples of the smoke were obtained, prepared under conditions still to be specified and to be done. The first sample was taken from the pipe with capacity to the capacity of a single (1) sample of the sample for use over 12.

The question of water-level (but not with regard to the pipe) is of course, it is advisable to mention the question of gas pressure, in the preparation of the water, more especially of water, and, however, the quality of the drug.

Attention to all these points should eliminate the possibility of error of diagnosis.

For convenience I append a list of "materials" which should be at hand in all treated departments.

Oxygen	Carbon	Iron sulphate
Aluminum	Ammonia	Iron sulphate
Phosphate of iron	Phosphate of iron	Iron sulphate
Phosphate of iron	Phosphate of iron	Iron sulphate
Phosphate of iron	Phosphate of iron	Iron sulphate

A sample of aluminum (1) 1000 should always be prepared for use in experiments on aluminum. Oxygen should be obtained in short notice. Similar positive results and the necessary equipment for (1) 1000 may be required.

Recent Medical History of the War.

THE PSYCHOSIS AND THE PSYCHO-NEUROSES

BY EDWARD MANNING LINDSAY THOMAS, M.D., F.R.C.P., F.R.S., F.R.C.S., F.R.C.O.

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THE PSYCHOSIS

The psychosis is a disorder of psychological function in which the individual's personality has progressed to the point of reaching the unconscious mind, in which the patient is aware of his condition, and is conscious of the cause, making a mental effort and coming within the scope of the treatment of the form of psychosis under consideration in this section.

The clinical types of psychosis differed in no way from those met with in civil practice. Again the general rule the mental state and health remained good and was concerned with nature, which was prominently in the picture. Consequently states of psychosis were involved with the symptoms of the patient and dignity of such while states of depression were associated with feelings of guilt arising from supposed derelictions of duty as a consequence of the patient's state, springing out of the enemy, and so on.

The one outstanding feature however in which the war psychosis differed in its course from that of the civil psychosis was that of the regression tendency to rapid recovery and readjustment of mental equilibrium. It is to be stated that, of all the cases which were unquestionably established as cases of war psychosis, 74 per cent recovered and became fit for the rest of their lives, the majority proceeding straight on their normal occupations in civil life within a period of three weeks, counting from the date of admission to hospital. The remaining 26 per cent of cases which remained insane after a period of two weeks' observation and which were eventually placed under medical and discharged to suitable institutions, included, of course, such chronic progressions which were a general paralysis of the insane, acute dementia, etc.

The problem of "hospitality" of the war period *from the patient's point of view* is of great importance in its bearing on the treatment of the problem of the patient coming on the civilian population. It has been previously characterized as one of a "hard and unromantic business" which, possibly, amounted to "the death sentence" of a dangerous conflict in the mind which results in separation on the relationship of the individual to his environment, and it is obvious that the great number of the cases of mental disorder arising in the course of the war were caused by the considerable disturbance resulting in the establishment of adaptation to the war environment. By the removal of the patient from the actual war environment by placing him in a hospital, or by returning him to civilian life, the majority of the conflicts which were the actual disruptive agents in the production of the war psychosis were solved and those in which might be inferred from the nature of the condition that the disorder would subside as it did rapidly and spontaneously. If this were the case, considerations applying to the matter, there is not much of hope of his placed in the civilian milieu, for it is a much more difficult problem to re-organize a civilian environment as to cause the solution of a conflict. There is, however, another most important factor which is the capacity with which the patient is put under control and treatment by the Service as opposed to the length of time which environment is permitted to elapse before the civilian patient can be so dealt with. The civilian case, not placed under treatment at a very early stage of the disturbance for various reasons. In the first place the organization of the Service is so complex that the slightest deviation from the normal constitutes a disability on the individual. Again the case is so open to observation as all his thoughts that the evidence of disturbed conduct are very quickly perceived by those around. Above all there are no legal limitations in his removal and prior to the placing of the patient under treatment. A patient can be sent into hospital for a mental disorder with as little loss of time and with no more difficulty than apply, in the case of a physical disorder. When it is considered then, in civil practice, a patient is left to his own devices as to whether he shall seek the proper treatment, a source of action which he is the least likely to adopt in the majority of cases, how extensive the disturbance must be before his friends are permitted to intervene on his behalf, how the legal difficulties and the legal stigma of certified insanity militate against the early treatment of the mental disorder in the civilian, it must be apparent, that the civil patient should be at such a disadvantage as compared with the service patient in the matter of the possibility of recovery. With the astounding results of the early treatment of the Service patient in mind it is to be hoped that the civilian will, in future, be given the same opportunity for early treatment without the stigma of the certificate of insanity as he was offered in his period of service during the war.

In contrast, as in the case of the psychoneuroses, so with the psychosis, there was almost invariably a history of predisposition, some, of course, in

these conditions dependent on progressive physiological deterioration of the organism such as general paralysis of the insane, syphilis, etc. The onset of the disease was usually sudden and unexpected. The history accompanying the cases practically always contained evidence of the obscurity of obscurity of the patient by his comrades. Only in very few instances, and then where the delusional state was found to be highly organized and the mind devoid of any confusion, was the commencement of the disease which led to the patient being sent in to hospital, a fairly unprovoked manifestation of violence. Acute conditions were rare, whether of the type of confusion or depression. The common presentation of the mental state was that usually associated with an advanced psychosis, whatever the ultimate diagnosis, ecological or otherwise, might be. In the history of the case commonly contained references to observed slight production of behavior, abstraction, and confusion or effacement and self-negation, as suggested by the circumstances. The mental state on admission was commonly one of acute or less confusion with lack of orientation, with associated delusional ideas of a vague persecutory nature, indicative of the usual psychological mechanisms of delusions operating under the influence of an intolerable environment. Hallucinations of hearing, vision, and smell, were frequently met with in the order in which they are mentioned; hallucinations of other senses were extremely rare. Hypermentation of the delusional state was rarely found in any degree and it is impossible to avoid the deduction that the placing of the patient under treatment, his removal from the incalculable situation contributing, at an early stage of the disorder and prior to more complex symptomatology, was the important factor contributing to the frequency of the favorable case of recovery, in so large a number of the cases.

Onset and supervening ideas apart from those forming the part of a delusional state were extremely infrequent. Observed fear phobias, as the value had been common. That most often presented was of a nature corresponding to the actual circumstances of the case and environment, it was very frequently found as a component of the mental state of the patient nervous and amounted to a marked fear of confined spaces. Its development in any particular case would often be followed. Depending on a very natural fear of going below in a ship at sea with the liability of ill effects, it became a true phobia in that the patient took the mental taking effecting him whether the ship lay in harbor or at sea and from that point it rapidly extended to cover all circumstances of the presence of an enclosed and confined space. Agoraphobia was on the other hand rare. Hypochondria occurred not infrequently and was commonly a concomitant of a manic-depressive state. The expression of the disease agoraphobia which was concurrently, named on in letters to the case with a view to their elimination on the matter and as an incentive to them to avoid the possibility of infection, incidentally led to them of the

time-treated, in spite of his position in the ranks of the men, and some possible minor worker variations developed the general picture.

Before passing to an analysis of the main of the psychosis, which occurred in David's case, mention may be made of the rather legal aspect of the work, in connection with them. As was to be expected the manner in which formed the starting point of the psychosis on the part of the recognition of the situation was concerned was plays of such a nature as to bring the patient into conflict with the disciplinary authorities and the psychiatrist was consequently deeply placed in the position of having to decide as to the responsibility of the individual in the face of the immensity of the act. Many cases of violence and individual, with marked individuality, to discipline, were sent to hospital from the detention quarters where they were either awaiting punishment or actually undergoing punishment, awaiting them already. Experience demonstrated beyond any shadow of doubt, that in the case of these individuals, the partially responsible individuals any attempt to test the machinery of the disciplinary code was more detrimental and only resulted in a greater degree of demoralization in an already unstable mind. From the point of view of the service such individuals were a source of weakness, and when the previous level of normality had been destroyed, as it was usually in the case of many of the cases the man was discharged as such.

As an illustration of this type of case may be cited the following —

History — Patient was admitted from detention quarters with the request that he might be observed with a view to the question of his sanity. It appeared that since joining the Service, some five months previously he had been a constant source of worry to his officers. He was intelligent and quite able, so far as his performance of his military duty was concerned, but he was always in trouble on account of his susceptibility to the matter of discipline. At first after a particularly great failure — he had made a serious error on his job, after an accident — he was confined to a house of twenty days imprisonment. They advised the chief work of the psychiatrist to be placed on being placed in his room, beginning to himself, looking looked patients, etc. He had become much more resistant in any other direction, also was extremely hostile to other soldiers.

The examination of the patient was found to be confused and disorganized and to have a variety of delusional and many delusional delusional ideas of an early type. He had received a flying ranting idea. He was rather impulsive, and more impulsive than in any other direction, speaking incessantly with his soldiers and with other patients.

Course — The presentation was of the classical type of a more phase of psychotic process than the transformation rapidly followed in the course of two weeks, and he then became somewhat more stable and reasonable. It was then that he was of considerable intellectual ability, very logical and capable of work generally, as capacity for thought being complete of continued effort, and great responses and interest in his general surroundings.

The case History — He had been a member of the first class school and soldier, one which was most typical of the class of men. Then however he had been a source of worry throughout, he had been expelled from school in connection with, however, he had refused to make at any one time of employment and though he had never actually been convicted of any criminal act, he served

expressions, history had been put in perspective, appeared in its fullness, and a very serious of the patient's disease. His level had dropped from ordinary average on the ground of mental instability, but left him very far from being fixed in a condition. History had placed the facts on a convincing basis as another part of the picture, while evidence that he was in a hospital was the first indication the father had received as to his son's whereabouts.

There was no history of family instability and four other children were perfectly normal and satisfactory persons.

In this case as in many others of the type, there was no question as to the absolute responsibility of ever making any satisfactory use of the patient for the purposes of the Navy at war, and he was accordingly discharged in the care of his parents.

In a certain number of the cases the judgment of responsibility and of future unsatisfactoriness was not so easy to determine but experience dictated that a history of chronic unsatisfactoriness in association with well marked physical symptoms of degeneration, marked unsymmetry of the face, considerable malformation of the palate or ears, etc., was a reliable guide in indicating the probability of the development of a psychosis under a perpetuation of the nervous life.

Such cases were reviewed carefully with the young men but it was equally necessary to investigate the service records of many of others now crowded with documents of a very progressive nature in order to rectify any deficiency from one which might have been taken from in the investigation of the condition. The following may be taken as illustrative of the point as far as concerned:

R. W., aged 35, French, R. M. C. 1. Admitted October, 1917.

History.—Patient was admitted for observation as to his mental state. He having appeared as psychotic in the service of a hospital, and it having been ascertained that he had been subjected to various physical treatments.

On examination patient was found to be somewhat confused also mentally and to have the fixed impression that he was a member of America with the right to wear many decorations including the Victoria Cross, etc. He seemed in his efforts to state some story affecting himself without regard to accordance with his intellectual state, and on others relating the question of nationality, trying to be saved from the great race, etc.

The physical examination revealed the signs of an early state of general paralysis of the insane, and the Wassermann reaction was strongly positive in the blood serum and the cerebrospinal fluid. Arrangements were made to deal with the case in the appropriate manner and the idea of the importance of the work of surgery was put forward as part of the psychiatric treatment.

Previous history.—His impression of the official record showed that he had been a most satisfactory member of the army and he had lately held the rank of sergeant for several years. In the early part of 1915, however, conditions had been made so he ceased to be able to do general unsatisfactory work, and, in May of that year, he had been provided for on account of unsatisfactory behavior. His good conduct badge and ribbon of rank. His name had been given in the possibility of any solid mental defect at the time.

In this case it was clear that the change from satisfactory to unsatisfactory conduct was to be attributed to the commencement of the physical

typical delirium of the higher nervous system, and, that, having brought to the notice of the proper authorities, action was taken with the effect of wiping out the delirium in the man's mind, as far as possible; the position was avoided. Unfortunately, this brought on what to the uninitiated was by this time was quite beyond any true appreciation of overstimulation, but it made a material difference in the way of pointing to his wife and child.

The malingerers in the Navy did not affect the psychosis. For the institution to be successful there is needed a very high degree of intelligence combined with incessant painstaking care, and if any attempt was made it was to be presumed that the subject gave up the struggle as the only right before he reached hospital. A few cases certainly were identified with a difference of an open question as to the question of malingerers, but the overwhelming mass, in the majority of instances, an acknowledged lack of agreement with the phenomena of mental disorder. In only one case at Chelsea with the diagnosis of malingerers definitely established and that was on a long, serious petty effort where none of us was exposed during the course of the war on a day on which he did happen to be at sea. He thereafter refused to perform any further duty, was recommended with, and finally placed under arrest. Probably some remark to the effect that he was here, have been out of his mind to correspondence with a comrade of action gave him the usual idea of maintaining sanity when he realized the situation in which he had placed himself. His behavior was, however, more eccentric; he destroyed his clothing, tore up a table of bedding, broke it in a sack, according to the popular conception of the lunatic with stones in his head, but as it would be failed to keep it up, and a very careful observation led to the conclusion that he was making every effort to establish the diagnosis of insanity, as contra distinction to the irreparable rule, which is that the only case of patient always under every opportunity of establishing the reverse.

The classification of the various psychoses is a matter of some considerable difficulty in the light of present day knowledge of the mind and in the wide adapted the attempt has been made to follow the more broad and generally recognized lines of classification.

CLASSIFICATION OF CASES WITH "MENTAL DISORDER"

The medical examination of the current material provided the entry of the cases, gross delirium, shock, and marked anxiety. Of the latter, however, two cases occurred at Chelsea. One was found to be hysterical sufficient within a few days of joining the service and the other had an episode fit in the street on the very afternoon on which he had been posted on his service and was brought along in into hospital. Both were, distinctly a degree, on one the episode was purely emotional and there was a practically no change in delirious presentation. One was a brother from

a northern climate, and he, who claimed to be a home body, was in the army at 33. Finally, but this last would detract from the consequences, because the [the] family is the one of those who become almost under conditions of war, and often to a degree changed.

The living conditions in the home, therefore, and the individual's psychological condition are stated to be 25 per cent. of the cause of psychiatric cases within the Navy.

Consequently the case would be sent into hospital for the request of the executive officer that men or boys having been found to be so minded and incapable of his duty that it was impossible to continue him. On the general rule, however, a statement as to what mental difficulties had occurred, and the presentation was that of a clinical or educational state in the type psychiatric delirium and hallucinations. In other words, the person who, these unconsciously had some slight here, with a other area, with the best of intentions perhaps, would have interested themselves in the patient, and then others to "show him up, as they say in the home would have been encouraged and adopted as the basis of a penitentiary system, while in a certain few these had been, undoubtedly a real persecutions wrong out of the treatment that is sometimes noted and to a great extent by its stronger effects.

As has already been mentioned many more were removed from detention quarters, and there seemed to be no question that the influence of the restriction of the punishment, the isolation for was the ultimate factor in producing the deterioration of the usually balanced mind, already in the danger of him arising out of the consequences of inability to keep up a competition with more normal individuals and the responsibility of avoiding troubles in the making of the service discipline.

Hardly the state was one of isolation, however it consisted in a poverty and depression. With very few exceptions a week of mental health in the observation of the patient with proper feeding, the isolation as mental improvement and, within four weeks the personal life of mental life was recovered and the patient was fit to go home to the care of his friends.

The relations, in a few instances expressed surprise at the development of a mental breakdown in the patient but as a rule they were able to supply evidence of previous mental mother and father told of the difficulties they had had with their child in the upbringing of the case which it had been necessary to take up during outside work employment in the patient prior to the war, and the development of a mental disorder may had been generally treated with some severity.

Cases of mental difficulty were inevitably revealed and developed from the Service Army effect, being made to ensure that the patient should leave the hospital under the care of some responsible relative or friend so that the period of readjustment to civilian life should be passed in the most favorable circumstances possible. It is to the credit of the Navy

death of the patient, the attending physician, as a rule, was not a surgeon, and, with practically no exception, no one who was found willing and prepared to accept the responsibility of the patient, unless the difficulties were rather on the other extreme, the parents often waiting to take the patient home before a satisfactory establishment of mental equilibrium had been made.

The defective mental state was a common accompaniment of the case of hysteria, and was usually present to a certain degree in the case of habitual nocturnal incontinence. Frequently, the patients were strikingly degenerate in bodily structure. The signs of degeneration of Lushenko, as to the degenerated significance of which much doubt has been thrown of late, were usually most strikingly in evidence in the state of case in the general system of the skull, the nasal and gingival malformations of the nose and palate, the asymmetry of the lower, the degeneration of the peripheral circulation, &c., the appearance of the patients in the mental department was defined most characteristically from that presented by the patients in any other general medical, or surgical ward of the hospital.

The mental deficiency, by which a child may be intellectually deficient, was not infrequently found to be morally deficient also; but the moral deficiency without intellectual deficiency was not met with. In the former such an individual is the weakling and, as has been previously indicated, he did not appear in the form of a mental case save in one or two odd instances.

The percentage of cases in which the mental disturbance persisted to a degree which prevented the discharge of the patient to his home was remarkably small and the disposal of the patient through the channel of institutionalization and confinement to a mental institution was effected in only 4 per cent of the cases.

DEMENTIA PARVOX.

Demented parvo, conditions constituted 15 per cent of the cases of psychosis in Naval service, and here the only corresponding was met as well treated—all per cent of them persisting beyond the length of time over which they could be kept under treatment in the Naval hospital, and requiring institutionalization and further institutional control. Yet when it is considered that functions of space amounted that few would be the numerous period of observation to which a patient might be subjected before his disposal was settled one way or another, even a 75 per cent recovery constituted very favorable with the experience of civil practice.

Of the paranoiac cases the large majority gave a history of previous psychotic disturbance with previous system treatment, so that the actual psychosis in the service was really to be regarded as of the nature of a relapse. In all the cases, present or otherwise, the scholars, when cases

covered, respectively told of abnormal slowness in the childhood and adolescence of the patient.

The earliest presentation of the disorder was that of the Heterophrenic type, with delusions of a grandiose and paranoid variety and non-definite border interests. Caseness with regard was rare and negligence to the degree of cataplexy, was not seen. In only two cases in Chastain did no real contrast to the epileptic state occur, and then the appearance of the phobic reaction is extremely limited in the length of time over which it was exhibited.

The patients were as a rule comparatively well educated and of an admirable intellectual attainment, though the amount of knowledge they possessed was generally found to be superficial and fantastic in its scope. Fairly enough quite a number of the dementia praecox individuals had been taking out a course of Polakianic pills in their youthfulness, probably the weakness of the short cut in time and the uncommensurate waste against profitability, as prominent in the advancement of that particular form of mental recovery, appealed to their capacious and facile minds. Thus one patient was admitted in a highly excited state of mind, grandiose and plausible to a degree, he was a flesh Herib Stearns, but had given up that work because he had been doing Polakianic and was about to be promoted to the rank of a Congressman. He felt that his mental improvement was so great that he could hardly restrain his impatience to wait, until his promotion came along. As, in the meantime, of course, his personal conduct was most deplorable, and he could not be expected to do any further duty in that capacity, and so on.

In the case of the two classes of disorder which have been mentioned, mental deficiency and dementia praecox, there was little indication that the stress of actual war service had any predominant influence in determining the onset of the mental breakdown; the psychotic disturbances were in all cases produced by the conditions of disciplinary life and the restraint and monotony of the existence on land duty. The majority of the cases were taken by patients having any appearance of experiencing the emotional stresses of actual warfare. The stresses of the incapable defects, under the stimulus of threatened punishment or stress to mind as the same looking as the normal individual resulted in the development of the schizophrenia psychosis, while the rebellious and egotistic tendencies of the dementia-praecox under the stress of the most disciplinary code and with the lack of efficient environmental stimulus apparently to the last led to the suppression of the actual violence and the adoption of the luxury life which is the outstanding feature of that psychosis.

MENTAL DISAPPOINTMENT SYNDROME

Mild depressive conditions occurred in the extent of 5 per cent. of the total. Phases of either acute transient excitement, or of acute agitated melancholia or stuporous depression were rare. Fixable mental locking as

Presented questions had little concern as a half dozen cases throughout the children. The mother's manner of treatment with evaluation of depressive manifestations and her lines were fairly equally divided between the two first considerations. Obviously there was a history of previous mental trouble. The majority had actually developed the psychosis on one or more occasions in adult life, and the previous and subsequent history of the deviance was often clearly indicated by the statements of relatives of the patients.

Recovery occurred in about one half of the cases and the causal determination agent appeared to be the influence of the restorative disciplinary life rather than the emotional disturbance of the actual war experience.

EXPLANATORY FACTORS

Confessional states with vague and disconnected delusional and hallucinatory phenomena were the rule in the incidence of the mental deviance but the evidence was so in almost every case from any rational intellectual defect in more than 20 per cent of the cases. The psychosis was almost all the result to the experience of severe emotional stress associated with the incidents of warfare or else, a followed lengthy periods of intense mental application. The general personality was one of reticence, incompatibility of emotional reactions, vague and indefinite delusional ideas, commonly of a persecutory type and occasional hallucinatory phenomena. Physically, there was usually the indication of over-fatigue and general debility.

The following case may be taken as illustrative of the type.

C. J. aged 32. A.D., U.S.A. Admitted September, 1917.

Patient was a member of the crew of a patrol vessel operating in the sea, frequently harassed by constant shelling and therefore not so attended to by the enemy submarines, etc. The work of the vessel was particularly tiring and trying, and had involved many emotional and disturbing experiences. Particularly in this the patient had been in a ship which had been sunk by torpedoes and as was afterwards stated, the experience had shaken him up. He had evidently been suffering from an anxiety neurosis to a serious extent.

It was observed, prior to his being sent to hospital that he had become dull and inactive, that at times he did not seem to be quite aware of what he was really doing, but it was not until he complained of a peculiar unpleasant mood which followed him wherever he went, that any attempt was made to deal with what was actually the matter with him. A medical officer was called in and in two days sent to hospital.

On admission patient was dull, tired and unresponsive. Foremost question was bound to be the experience of his opinion on some single matter, but it was evident that it suggested some considerable effect on this part of the patient to encourage him to listen to the point to the conversation and any matter which required any extensive thought was beyond his power of acceptance.

The unpleasant mood came of him gradually, but he had not attempted any explanation or more or less could be got out of him was this, he was passed some measures to bring it. He was threatened to kick him and place, agitation,

by itself is full without conscious use of the apparatus, she has food only when it is placed on her mouth, and she is so oriented to dress and undress and toilet operations as the meeting of personal necessities. Consequently, he would readily admit that there is no mind in her. There is quite another question as to whether or not she is conscious of her own existence.

He recognized her as a person, he, because he was here, but did not seem haunted or concerned with her as he had not observed in details of her existence.

Perhaps that is it. He cannot tell if one can tell on the grounds of the data he set out to his previous day's conversation. There had been a great boring operation but had been followed by a fallow, and there was no question of any abnormality of mind either in her behavior or in the results so far as she knew. She recognized the trouble in the hospital as being hers, she wrote and had a great fight get over her previous experience while having the work.

It was—under her eyes, patient rapidly progressed. Within a week he was much brighter, was sleeping, and moving properly, took his place in the hall for a while. There was still much to be done.

In a fortnight the children and the parents had been all recovered and a good number in the hall, enjoying a normal existence in his surroundings. The other two girls were at the hospital because of the work. He could not describe it, it was simply a matter of time, the work was done, and it was not in them. They were not in the hall, and it was not in them, but it was not in them. At the stage he did not observe the difference, and yet, personally also he was not in the hall, it was not in them, and it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them.

At the end of three weeks the patient was again recovered. The doctor had seen the patient at the hospital, and it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them.

Finally the boy (patient) was all better and when he was well and an excited condition was reached. This, as we saw, following a period of considerable time since a period of time was reaching him, it being a year, but now people were in the hall, and it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them.

A certain number of the cases gave a history of previous mental instability, but these were minor, in which no indication could be found. With very few exceptions (mostly), sufficient effort took place, and the patient was not disturbed by the work, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them. It would probably take some time, but it was not in them, and it was not in them.

Discussion

Persons of this age have been already pointed out, were not in the report on the presentation of the disorder mentioned above. Typical patients were obviously rare but between the maturational state with rapid development and the fully organized compound maturational scheme of the typical individual, many cases were encountered in 7 per cent of the total. These cases presented an intermediate condition that represented character effects,

of strongly individualized. The new illness getting rid of them would necessarily give a remedy to the effect of chronic discomfort of hospital bed patients or current complaints of any other individuals. The on the part of the patient. The new illness would present itself in the life of the patient. The patient would be in the effect that he had seen a sick man the second time at the time of passing the ship that the illness is that patient who had a grade against him, that he believed was positive of him that no one would believe in him. All these statements being supported by detailed anatomical evidence.

In a general rule it was found that the heavily attacked individual in the hospital ward resulted in the quick disappearance of the individual reaction of the patient to his immediate environment or other words the patient could not be regarded as other than perfectly sane. In point of observation in hospital at the same time the personality, which he himself in have been contained in the past would still be held in all its force and clarity. A hospital in such cases could not, not in the establishment of the history of the patient's statements, with absolute support that could be obtained from the observation of strong, constant and continuous in the conduct of the patient while in hospital. Such support was frequently forthcoming, but more in the cases where the personality scheme was obviously based on more particular as in instance on the case of an officer who during many periods of absence of health treatment complained that the patient in the next had to live in the hospital of a long time from home was not really a sick officer but a healthy, vigorous under orders to which his every movement and to take down his, given, and it was impossible to obtain the necessary evidence of witnesses to the conditions alleged and as to which the witness of proof is stopped at the hospital material. Particularly difficult was the formation of satisfactory evidence in those cases where the personality was concerned with the conduct of the patient's relative, especially individual and personal conduct of the wife. Here the official records were of no account whatever and each case gave rise to such interest.

Consequently it was found that, with the capacity for unity, in the relations of the patient to his fellows in hospital and particularly with the development of an unstable relationship between the patient and the medical staff, some possibility of influencing the patient to the end of serving his case as a compensation. The hospital material, the accidental circumstances of the previous personality, were thoroughly discussed in detail with the patient the other side of the question. We had before him: he was shown where possible instances of miscomprehension might have occurred, serious difficulties were explained to, and in the same the words meant that the patient was led to recognize his error and to appreciate the nature of judgment which he had made.

When such a communication had arrived in any case, the patient's relatives were informed as to the nature of the condition and as to the

state of affairs and the patient was satisfied and discharged in the case of some inoperable psychosis the diagnosis for purposes of discharge being out of consideration. The patient then felt that his mental state was not improved and a serious possibility of further deterioration was revealed.

One account in which the patient did not recover might only be a recurrent attack and sometimes these attacks were based upon matters of a minor or trivial importance. In such cases the whole of the focus in the patient's mind then was subordinated for investigation by the authorities, and action was taken according to the official conclusion.

In point 11 I noted typical psychosis in which the preliminary seizure was confined to cases the hospital authorities while the patient was actually under observation was rare. The overtones of interest in the length of time over which the delusional state had existed before any suspicion of the reality of the patient had been raised. For instance a gentleman of the *Weymouth Police Force* who had brought charges of a delinquency in an assault against one of his brother officers, which act was the more, after long, placed under observation complained that he had been informed about and spent upon for the last ten years. For that period of time he had no recollection of his life in going about so that he could not accurately state his personal life. When it is added that an unfortunate mental war found amongst his officers, and that he was in the habit of smoking a small and harmless pipe the picture of his condition can it may be imagined what a capacity he has for the unreliability of the personal eye witness. Again an officer of high rank became convinced of the accuracy of his evidence and subsequent competency in the eyes of others under his command. If anyone who a few years later was suspected, he employed detectives while being a man with a great possibility he developed an interest, capable to those who knew him previously, and he concluded in examining himself with an atmosphere of hostility about only seemed to lead the lives of the delusional state, and to add conviction to his delusory state. It was not until this state of affairs had been in existence for a matter of six months that any doubts arose as to his sanity, but under observation in hospital he was found to be the subject of a most elaborate and completely systematic of delusional state. It has again happened to me that I am at my children as an indication of the general evidence to which the patient was subjected. The account mentioned on suspicion that the patient believed that the man was taking his feelings of the matter learned or shared any sense of significance, it was an index of the contempt with which the patient was regarded, and in so doing every person with whom the patient came in contact. It also was circumstances the diagnosis presented no difficulties and the only possible cause of action was to place the patient under proper conditions of control.

Generally speaking, these patients attack have the outcome of the diagnosis of individuals with exaggerated personal traits, and consequent

opinion tenderness in the responses of the mother. The policy of advice and encouragement attributable to the "system" was in the foundation stage in such presentation of the systematic bilateral stimulus. The disappointed were not encouraged to investigate and it is often hard to adopt the passive position of waiting for a few minutes before of self-will and under the control of the mother with the experience of many systematic disturbances. Many individuals of consistently balanced emotional tendencies showed the first developmental stage of the reaction in the production of a systematized bilateral noise.

SYSTEMATIC PRESENCE OF THE NOISE

Cases of this disorder occurred to the extent of 19 per cent. of the total not a very high percentage when it is considered that the right eye alone was involved throughout.

The age of development of the disorder was on the whole 1 year 3 months that met with no oral practice. A number of cases were of equal or, third, one was only four months from birth when the trouble was first found in most over thirty years or thirty-eight. Hospitalized cases were not reported, owing at least be supposed, to disturbance in the attending officers.

A history of the correction of strabismus at an age between seven and twenty five years was obtained in the majority of cases, and the Wason case in particular was unusually perfect in the ideal sense. The test was not carried out in the developmental field of all cases, but where performed it always gave a positive reaction. It is of interest to note that in practically all the cases the noise syllable treatment which had been carried out at the time of the original strabismus was rudimentary and inadequate as judged by the prevailing standards. In only two or three cases had there been any systematic memory administration and in only one case at Chatham had the patient been given one of the assumed noise-syllable drugs.

The course of the disorder was in a rule, moderate, in fact the common presentation of the mental state was that of the sensory nervous. An early diagnosis gave the slight disorder and the slight clearing of the speech were found to be the most helpful. The poor children were of late development in the sensory. The Argyl Robertson pupil was rare variations from day to day, of the disorder of the pupil, variations of use between the two pupils were more characteristic of the condition. Physical signs of disorder of the central nervous system were less marked than the evidence of psychological disorder than being due probably, to the special stress on the higher psychological functions arising out of the war circumstances. The treatment, varied, irregular general practice was subsequently seen, especially the patient was, repeated treatment, and success and rarely achieved that overlooking self-medication as associated with the typical test book description of the condition.

The significance of the ankyra movement was first made apparent, as may be seen by the comparison of two cases for the illustration of this point.

Two men were admitted to Chatham Hospital on the same day with the diagnosis of myasthenia. Both had been the distinguished Infantry Major, about six months previously, and both dated the onset of their symptoms from the exciting episode in which they had gained their decorations. Both showed a general state of considerable physical debility and the complaint was the same in each case, namely, headache, to some extent, the fear of swimming below deck in a ship at sea, and a progressive difficulty in maintaining the necessary manual application of force to the proper performance of their duties. In the general condition the two men were indistinguishable. A logical examination, however, revealed the following points of difference:—

Case 1.—Papilio showed more asthenia to light, as defined in the usual estimate. Also, of speech, though there was a slight emotional respiratory hesitancy, no (real) defect of accuracy for recited words, though the general character of "forced" paucity.

Case 2.—Papilio *sericus* presented a high asthenia in written speech in prose, although on response to light, a trace of slight volitional difficulty in pronunciation, with no respiratory hesitancy in the production of speech. Disordered urinary defect and lack of sharp in the recall of recent events.

The first case gave the history of myopia and the Wassermann reaction was negative in the blood serum; the second indicated a paucity more slight given previously which had been inadequately treated and the Wassermann reaction was markedly positive in both the blood serum and the cerebrospinal fluid. Under treatment further evidence for the differentiation of the diagnosis was soon forthcoming, the first quickly responded to change of concentration and treatment, showing the usual course of the varying character while the second steadily deteriorated and entered the progressive domain of the general paralysis.

Consequently it was found that most of the disease would occur with the relief from the stress of the war environment, the patient being left with only slight defect, but, apart from these related examples, the deterioration was rapid and the case was of necessity placed under proper institutional control.

DISCUSSION

Each type of disorder, including demencia paralytica, were prevalent to the extent of 14 per cent of the total. The mental state was still over a negligible proportion of the cases associated with general degeneration and the influence of myopia on the production of the disorder became large. From 80 to 90 per cent of the cases gave a positive Wassermann reaction in the blood serum but the cerebrospinal fluid showed pathological characters in only a few. Premature senility was of common occurrence

regarding its occurrence in individuals of any known age. It occurred from childhood—the mental state was characterized by acute signs, marked withdrawal, stupor, vagrant eyes and such cases were entered under the description of organic brain disease.

The presentation of the case of dementia without any definite demonstrable organic lesion was again commonly that of the senile state with a certain degree of confusion and general mental defect. Vague and ill-defined delusional ideas, unformulated hallucinations, confusions and twilight dominated by the senility reaction to the surroundings were the rule. Hardly was there such a fully-developed delusional state as to give rise to marked disturbance of conduct. Generally it was found that such vague delusional states disappeared under the hospital environment and gave place to the apathy, apathy, indifference, etc. of the slowly progressive mental defect.

Occasionally a phase of excitement was witnessed as happened in the case of a quiet, unobtrusive dement of 30 years of age who was about to be released and discharged to his home. Without any warning he became wildly agitated, and when restrained with by a V. A. D. nurse, he placed her down the road, a pistol in his hand, waving vengeance to her for the supposed murder of his wife and family. The attack subsided in the course of a few days but the arrangements for the disposal of the patient were altered and he was placed under institutional control.

THIRD PICTURE.

It was difficult in a number of cases to estimate the experience of a possible toxic source in the production of the psychosis, but those cases in which a definite causal relationship appeared between the production of a psychosis and a possibly toxic source amounted to 1 per cent of the total psychoses of organic origin are not included, they having been dealt with elsewhere.

Following up a long case of a psychosis, was confusion. It was suggestive to eliminate the possibility of an accidental poisoning as a complication of the initial delirium there because the case did not come under observation for the mental state until the attack of liver had passed by. A previous history of vomiting, from a psychological point of view, and the occurrence of an apparently unprovoked attack, with recovery of confusion, followed by the appearance of a psychosis constituted the justification for neglecting the cause and of additional source. There were no particular features of the mental state to call for attention, generally, there was excitement and occasionally the acute statements of mania but delusional states with partial systematization were the rule. Early the case recovered while in the hospital under observation and the general impression was that the disorder was of a chronic nature and that if recovery did follow it would be accompanied by defect.

One case was observed in entering during the course of convalescence from a protracted but clinically uncomplicated attack of typhoid fever. Here the mental state was strongly suggestive of that of dementia parietalis, but the physical signs of that disorder were absent, and the Wassermann reaction was negative in both the blood serum and the cerebrospinal fluid. Recovery, without defect, took place in a period of four weeks.

Of the cases in which a psychosis was noted as being developed as a result, the subject of one of the chronic infections—say, for example, tertiary syphilis. As—the bulk of the evidence pointed to the conclusion that the psychosis was the outcome of the exposure of an individual at predisposed psychosis, tendency to the environmental causes of the war, rather than a result of the action of any particular toxin. If the physiologically acting toxin was concerned at all in the production of the psychosis it was to be perceived that the correlation of cause and effect lay in the mental stimulation accompanying the general physical debility of the chronic disease. Under such circumstances a pre-existing hereditary psychological tendency would naturally be liable to be made manifest in the evolution of an abnormal reaction to environment.

The same remarks might be made concerning those cases in which alcohol was suspected as having played a part. There are few cases in which the diagnosis of alcoholism could be made with certainty, and, for essential reasons, such a diagnosis was questionable unless the supporting evidence was incontrovertible. In the majority of such cases the alcoholism was found to be secondary to a pre-existing state of anxiety nervous, and, in a large number of instances, there was an indication of a predisposition of the patient to a mental disorder. Thus the admission of an officer on a charge of acute alcoholic delirium, was followed within a few months by the development of his psychosis in a condition of anxiety nervous, with a marked paranoïd reaction. The difficulty of isolating the alcoholic factor as the pre-moment etiologic cause, may be gathered from the brief description of the following case. An officer was admitted, having been arrested on a charge of assaulting the British police. The mental state was that of the hysteroid type, with a certain amount of talkative excitement. Clearly the indications were those of an alcoholic psychosis with, however, some considerable atypical variation. On going into the history of the patient, it was found that he had sustained a severe head injury prior to the war, that during the war he had been subjected to extreme environmental stress, and that he had been under treatment for an infection by the patients of malignant tertiary syphilis. Under treatment the reaction resolved itself, but at all rates the usual infection psychosis, and subsequently, into the anxiety nervous. It was clear that the course of events in the production of the actual psychosis for which the patient was admitted was as follows: A physically powerful man, with a love of adventure and no experience of war, the patient had thrown himself into his war duties with the utmost enthusiasm. He was impatient to a degree, which constituted his only

frustrated in the joys of his expensive officers and he quickly established a reputation for courage, &c. He had many opportunities of fortune, including his being taken prisoner and his escaping from captivity. He was laid up and was seriously ill with his universal debility, and the consequence was that he could no longer do his duties with that degree of personal ability to which he had been accustomed. He refused to recognize the change within himself, continued to subject himself to the environmental stimulation of the instinct of self-preservation, and there is no doubt developed the anxiety neurasthenia. His housing, ventilation, lighting, recreation, he was unable to sleep in a room alone without a light, he found himself restless on the least occasion, &c., &c. Naturally his nervous very depressed, and, from being a temperate man as regard to alcohol, he fell so drinking his wine and assisting by the consumption of an excess. The sequence of the psychosis was then not long delayed.

TREATMENT

The general plan of treatment followed in dealing with the psychosis may be outlined briefly.

The all important feature was the establishment of an amiable understanding between the patient and the medical officer. To know the physician is to know the patient and that understanding can only be achieved by approaching the patient in the attitude of a friend and by his being conversed of the personal interest of the physician in his case. Only then can the analysis of the case be made with any thoroughness and satisfaction. The physician must get to know what is passing in the mind of the patient so that he may be certain of applying his influence in the direction of helping the patient to disentangle himself from neurasthenia, and so that by confidence argument he may not intensify the delirium of the patient. Patience and careful observation and often patience as what denotes the patient may be accessible to influence, and the path having been opened it must be followed up relentlessly.

Careless and restriction of liberty, which are unfortunately necessary in the majority of cases at the onset, were limited as far as possible, and the earliest possible moment was seized to align the patient following his own inclinations, every encouragement being held out to the patient to direct his energies into some regular and profitable channel. It was impossible to provide much variety of employment by the establishment case beyond that to be found in nature of cleaning, &c., as the ward staff, but a certain number of patients were given occupations in the grounds of the hospital with benefit, not only to themselves, but also to the other patients in the provision of vegetable produce for the ward.

Food, physical and mental was regarded as an essential in the treatment of the case, and in treatment of systematic neurasthenia were used freely. As a rule it was found, however, and especially in the cases of

calmness and confidence that the relief of experimental nerves in the placing of the patient in the hospital ward, was sufficient to permit of sleep-coming without any sedatives and. Hence confidence must, next, be obtained, strong treatment and the administration, judiciously, of the combination of hyaline and morphine was found to be the most satisfactory line of action.

The relatives were encouraged to visit the patients frequently unless there were indications otherwise. Regarding the attitude of regarding the mental disorder in the same light as a physical disorder, much benefit was obtained in the respect of mitigating the distress of the cases. The letters of the patients received much more ease if the expressions were checked to the true reality in the mind of the general public, be improved, and the one sought was to send the patients back to his ordinary life with no more retrospective consciousness in him or his friends agents than would be present if the disorder had been one of purely physical character.

As the role of the education of individuality is much to be too strongly emphasized that the attitude of the medical officer in the foundation stage in the treatment of the mental disorder. Physicians who really and consistently practice their profession may be roughly divided into two groups. Those belonging to the first treat the diseases with which they are confronted those of the second treat the patients and in dealing with a psychological disorder, it is of paramount importance that the patient himself should be treated. It is the creation of the actual personality of the patient in his environment which is at hand and not a local disturbance of physiological activity which can be dealt with by the use of chemical or physical remedies with indifference to the patient himself.

A knowledge of and an understanding of the personality of the patient is therefore essential so that the physician's attitude may be properly modified to the requirements of the case, for it must be remembered that no indiscriminate application of sympathy or to move to the indiscriminate adoption of the opposite attitude of hostility and indifference.

The disturbance of a mental state is an operation depending upon considerable time in the majority of cases, the patient cannot be hurried, and, as a suspicious patient every management will need to be given and, if the interest of patients will be called upon. The result of a penetrating mental examination with the recognition of a tendency to impulsive action, to hostile action, to suicidal action, or the outbreak possible moment or the effective treatment may be taken, is considerable in the curing of trouble and worry for the physician in the future handling of the case.

The physician, however, cannot be continuously observing his patients, he must necessarily rely to a certain extent on the reports made by the members of the staff, but still under his administration, as in the general conduct of the patients in the clear-cut ward. Intelligent co-operation on the part of the staff of the ward is an essential in the treatment of the

mental disorder is that an shaking of influences must occur, and the selection of exercises with an appeal to the work, with their education to their special duties is an important factor in the successful treatment of the mentally disturbed.

PREVENTION

The prosecution of a war on the sea, of the length and magnitude of this contest, which has not terminated, most seriously asked a certain amount of psychological disorder in the individuals involved. The great strain, however, to which the development of the psychosis and the psychic illnesses has occurred is Naval service demands some consideration from the point of view of contributing by what measures of way, these conditions may be preventable.

In handling the question of the prevention of purely physical disorder in a service such as the Royal Navy, three main principles are recognized, and these which are as follows, are equally applicable to the problem of the prevention of psychological disorder.

(1) The early recognition of a disorder and the recognition of a tendency to a disorder is an essential.

(2) The attention to the hygiene of the surroundings of the individual in the Service.

(3) The adoption of measures directed towards placing the individual in a better state for resisting any deleterious influence which may be operative out of his surroundings.

Turning the focus and above their psychological values, it can be clearly seen that any steps in the direction of the prevention of the psychological disorders must, be on the paths laid down for the prevention of physical illness, the difficulties which must arise out of the present day lack of knowledge of psychological matters as compared with that detailed knowledge of cause and effect which obtains in the sphere of physical disease.

(1) The first principle, that of the recognition of a psychological disorder at an early stage or of an incipient tendency, has an application in the one hand to the recruit, and on the other to the man in the Service.

Heretofore, in gauging the mental fitness of a candidate for the Service, the proverbial saying "a sound mind in a sound body" has been accepted as a reliable working rule. The experiences of the war have demonstrated, however, that such an assumption is now no longer justifiable and that some method of psychological examination of the recruit is necessary. The difficulties which lie in the way are connected with the carrying out of such an examination within practical limits of time, and with the standard nature of results. A scheme has been worked out and applied practically, with, it is said, satisfactory results in the United States Navy. By means of a series of simple and quickly applied tests, an impression is made of such

usually requires, or requires necessary attention, etc., and make individuals accept the proper course should any hold back for a more extensive psychological investigation, or a result of which the question of the candidate's moral fitness or fitness for service is determined.¹ The adoption of any particular standard required for fitness or otherwise arbitrary at present, but an experience is accumulated there is no reason why the standard required should not be as definite as that followed in the acceptance or rejection of the recruit on the result of a physical examination.

Apart from the elimination of individuals who would constitute a burden on any service in which they might otherwise be admitted, the results of such an examination have a value in affecting some selection of the suitability of a candidate for any particular branch of the Service.

The application of the first principle to the recruit was earlier mainly allowing the medical officer, but in its application to the man on the battle the early recognition of a psychological disorder is largely in the hands of the executive officers who are more in touch with the men and who have more opportunity, therefore, of observing minor changes of conduct or disposition in the recruited psychiatric individual. With a view of facilitating the placing of the early case under proper care, the following procedure was adopted in the United States Navy:

A printed sheet is distributed to all company commanders with instructions that they are to report all cases showing any one of the following behaviour characteristics²—

- (a) Excessive failure to discipline or inability to be disciplined
- (b) Excessive stupidity or recklessness or doubt or confusion
- (c) Inability to transmit orders accurately
- (d) Personal uncleanliness
- (e) Criminal tendencies
- (f) Abnormal sex practices and tendencies, including masturbation
- (g) Filthy language and debasement of property
- (h) Excessive feminine types
- (i) Bad-manners
- (j) Suspicion of confidential relations or spying
- (k) Quack or positive behaviour
- (l) All recruits who show persistently the following characteristics:

1. Extreme instability, nervousness, weakness, depression, shyness, retiring and social attitude, over-humourousness, suspicious, delusory delusions, sleep-talking

- (m) Chronic home sickness

¹ J. F. Bush, *Mental Examination for Recruits*, United States Naval Medical Service, vol. 10, No. 2, April 1903.

² J. F. Bush, *Idem*.

Each behaviour characteristic are most common. *Indifference* is a state of mental deficiency, or of early failure of adaptation, not accompanying of epileptics in whose conduct they are exhibited as the primary cause under the care of the psychiatrist as soon as possible would unequivocally, using the further development of more or less mental degeneration.

In the Royal Navy during the war, as such definite characteristics were noted, yet many cases were admitted to hospital at the instigation of the executive officers who had observed one or other of these abnormalities of behaviour in an individual under his authority. On the other hand, many instances occurred of men who had been subjected to disciplinary action and who had developed a well-marked mental disorder subsequently, a state of affairs which might have been prevented had the significance of these behaviour characteristics been made more familiar to the executive authorities concerned.

(ii) The second principle, that of attention to the mental hygiene in the application is largely outside the sphere of the medical officer. In the Royal Navy it was neglected to a great extent at the commencement of the war, largely because the interest and enthusiasm prevalent at the start of the campaign were reluctant to carry the man on without any other aid. With the prolongation of the war, however, the mental aspect naturally attracted a serious interest, and it became necessary to take steps to change matters.

Men have been ordered instantly, on entry of ship life, to be needed something from the mental point of view in necessary conditions of life here the physical aspect. Much was done in this way by the introduction of cinematography, the employment of women's pictures the granting of greater facilities for leave and for restorative exercises, and by paying a greater attention to the personal appearance of the men in uniform affecting their prospects in the Service, their morale, psychology and conduct.

(iii) The application of the third principle, the adoption of measures directed towards placing the man in a better case for creating deleterious influences, is limited to the sphere of education and training.

The training of the soldier as has been previously stated, has for one aim the rendering of the individual man into a perfect automaton, for use in machine-guns and in operating gunnery, and in the achievement of its purpose it cannot be too highly praised. As regards the further education of the man and officers in matters relating to the conduct of the various operations of the war, a considerable amount was done, having regard to the necessity for secrecy in these matters. Yet it cannot be too strongly emphasized how much can be effected in the way of the weakness of the soldier's machine, or the mental breakdown, by the stimulation of the interest of the individual in what he is doing, and the replacing of the suggestion that his individual efforts are not wanted.

Speaking broadly, apart from the question of the remuneration of the recruit, the mental health of the Service rests in the hands of the executive

entirely from the highest down to the lowest. Given stated material by the discussion of the psychological state of the leaders of navy, the executive authorities have the making or marring of the individual in their compass. The unhappy ship, the distressed ship's company is a fertile soil for the development of psychological disorders just as it is favourable ground for the malfactor, and the happy ship is largely dependent on the relationship of a true personal interest between officer and man. Where this is satisfactorily established many possible causes of mental conflict are avoided. The man, feeling that his interests are safe in the hands of his officer, is relieved of many anxieties, while the officer, feeling that his men are at one with him, has the load of responsibility considerably lightened.

It is fortunately true that by virtue of their experience of life many naval officers become practical psychologists for in their appreciation of the principles involved has their capacity for the handling of their men.

Not only however can disorder be prevented by the intelligent use of psychological principles, but otherwise can be thereby increased. A happy illustration of the point is afforded by an incident related of the naval operations in the Persian Gulf. A hostile mine was detected for the purpose of overhauling and examining the mine trails in order to stop the practice of emerging arms and ammunition designed for the mine, a duty which considering the heat and the climate, involved a great expenditure of energy on the part of the men concerned. After a long and tiring day of many disappointments, during which the mine and influences of the mine had responded to none, a mine vessel would be sighted for a day. Owing to the hard conditions of the men, it would have been hopeless to expect to establish any mine something more done to cause a little interest in the mine, taking from his pocket a note book which was supposed to contain the description of specially suspected vessels would make believe to read out of it a description of the vessel actually in view at the moment. Stimulated by the thought that here at least was a certain prize, enthusiasm would revive the men would pull off with a will and the ship would be caught and searched.

CONCLUSION.

In completing this all too brief survey of the psychological disorders which have arisen in the Royal Navy during the course of the war, the author is only too conscious of its inadequacy. The subject is vast in extent and could only be adequately dealt with by a work of much greater volume. It is hoped, however, that the several features, that these disorders are the outcome of the disturbance of the relationship between the individual and his environment, has been made clear, but, with the proper education of those that carry decisions in the understanding of these conditions may be cleared away.

At the time of writing, August, 1939, the full detailed statistics are not yet available, it will, therefore, be necessary to add them in a separate table. In the meantime a rough estimation would place the number of casualties due to psychosis in psychomotor, at the lower-estimation of 50,000, a figure which is sufficiently startling to draw attention to the importance of the subject.

Although, to a certain extent outside the true scope of this review, matters of general policy and of the relationship of the executive branch to the subject under consideration have been given reference. From a purely psychiatric standpoint, naturally, these matters are not relevant, yet, from considerations arising out of the practical work in the Service the author has deemed himself justified in including them in the title of the good mental health of the Royal Navy.

Acknowledgments are due to those authors to whom works referenced have been made in the text, and to which works the reader is recommended for a much more full exposition of the subject than can be found here in, and to Surgeon-Commander W. E. Mason, R.N., for his kindly help in the revision of this paper.

In conclusion, the author would take this opportunity of expressing his appreciation of the help he has derived in the past in the practical handling of the problem arising out of the actual work in connection with the psychological disorders, from the officers of the Royal Naval Medical Service, and particularly would he like to mention the name of Surgeon-Captain G. F. Collingwood, C.B., R.N.V. R.N., on whose philosophic breadth of mind he many times relied to meet the tide of work which threatened to overwhelm him.

PART I.—RADIOLOGY

I.—APPARATUS.

(1) Ionization Cells, &c.

(a) **HOSPITAL SERVICE.**—All the large naval hospitals, at the outbreak of war, were already equipped with efficient coils and accessories sufficient to meet the demand made on them for war work, though in some instances the portable coils for work were not quite up to the mark—the being important to work with a generally of a heavy nature, e.g., such cases as fractures of bones, joint ankylosis, &c. During the war this was rectified and before the outbreak of hostilities, not only were up-to-date portable coils provided, but also the most array installations in these hospitals were so modernized as to be capable of doing all work, with the exception of radioluminescent photography.

Subsidiary hospitals and establishments were equipped with coils of less power in some cases being given coils which had been used in the larger hospitals, and in others being supplied with Barrow Adcock coils. Later, some of these were supplied with what is at present the standard coils, but of slightly less power than that supplied to the large hospitals.

The following is an account of the standard array coils supplied. They are manufactured by Messrs. Decca—

Coils of 60 m. are supplied to large hospitals. These are supplied to small hospitals. The whole apparatus designed to work from the mains at 250 volts.

Interceptor is of the mercury jet type. 4 lb. of mercury are necessary.

The discharge is either gas or ether vapour. Gas may be supplied from the mains. In this case connect one of the gas nocks of the interceptor to the supply by means of rubber tubing. Allow the gas to pass through the interceptor until all air is exhausted. To test this, light the gas at the end cock, turning this off when the flame has no flicker. The gas supply should be left turned on to keep up a positive pressure. The radiocob should be kept closed except when periodically recharging with fresh gas. Care must be taken that the lid of the interceptor is securely screwed down so as to make it air-tight. If no main gas supply is available, then gas is provided in cylinders, and the interceptor is filled through a gas bag. First turn on cylinder by the filling key. Then turn the adjustment valve till gas-flow is fully detached, then turn off cylinder. The interceptor is then filled from the gas bag or from the main supply. On closing the cock it is well to see that the gas-bag is still somewhat distended so as to keep up a positive pressure of gas in the interceptor.

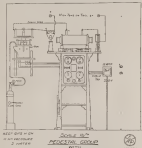
On some of the interceptors a reservoir for producing ether vapour (to replace gas) is fitted (Fig. 4).

Fill reservoir with ether. Leave out-cock open till all air is displaced and a strong smell of ether issues from it. The reservoir will usually



valves. When these valves are set as indicated in Fig. 1, the gas flow will be over the safety valve on the left, even during ordinary duty, sufficient pressure being maintained.

The motor is mounted on a rock bracket and connected to the interrupter by a belt drive, thus being easily detachable. There are four contact blades inside the interrupter, of which two are triangular in shape



RECTIFYING INTERRUPTER

FIG. 1.

and are adjustable in level. These latter are controlled by a handle on the left. By turning this handle the distance of contact with the jet may be shortened from that required for a direct supply to that required for a 500 volt supply. By use of a small variable-resistor on the control board, labelled "Intensifier," two or four contacts may be employed in each revolution of the interrupter; usually, four will be used. By the control of the contact blades, whatever the voltage of the supply, the red and interrupter can be "tuned" to produce three consecutive arcs. The following procedure is a good one to adopt:—

Having placed the primary current rheostat in the "strong" position, *i. e.* with all resistance out, switch on the current and gradually bring the blades into contact till the milliammeter shows maximum current and remains steady. If too much of the contact blades are exposed to the anodes yet, over saturation of the coil takes place and the needle of the meter is unstable. It has been found that, working at 300 volts, the best position for the jet to impinge on the blades is about half an inch from their points. There may speak of the interruption, and you may get a very slight improvement in the above result. It is also useful when maximum currents are desired, as in x-ray treatment or when an x-ray tube has to be re-conditioned by running it with small currents. In this case only the points of the blades are exposed to the jet.



FIG. 4

The Mechanical High-Tension Rheostat fits on top of the interrupter, as shown in the figure (Fig. 4). Its four radial arms rotate round their central axis in synchronism with the spindle of the interrupter making contact with the lateral contact pieces, the position of which may be adjusted by means of the horizontal rod handle, connected to the axes arms carrying the vertical supporting pillars of the contact pieces. This adjustment may be carried out while the interrupter is running. When the needles is in position the revolving radial arms should make contact with the fixed lateral contact pieces at the moment of "break" in the coil, thus never making the high-tension induced current in the x-ray tube. At the next expected moment of "make" an air gap will be introduced between the end of each arm and the contact piece, and the resistance of this will prevent transmission of the "square" current. Carefully adjusted, the sparking which takes place between the radial arms and the fixed contact piece should be confined to the length of the latter, if out of adjustment the sparking will be driven out either to meet the approaching arm or to follow it. In the former case the lateral contact piece should be rotated



Fig. 1



Fig. 2

in a backward position relative to the resting arm, in the latter case they should be advanced, in either case the arm being in relation the opening to a window.

In setting the mechanical reciter in position the lower end of the spindle fits into a socket at the upper end of the interrupter spindle. The tapered legs which support the reciter are clamped to the top of the microscope by two screws. In doing this care must be taken to avoid forcing the spindle from its seated position. To test this the spindle should be raised from its socket several times and the screws adjusted so as to keep it securely seated.



FIG. 4.—Complete X-ray apparatus for use in study.

10. Interrupter Apparatus.—From 1900, a ray outfit has been in use and applied to dogs, etc. Each year from six to ten were added and at the outbreak of war about a hundred were on charge. They successively passed through six types, ranging from the old portable 50-volt 10 cc. sets to the Levine 100 volt 1.5 cc. sets supplied in later years. In 1905, 100 volt sets were first ordered, and in 1912 sets capable of being varied in variable voltages of 50, 100 or 150 volts were incorporated. This, through perhaps decreasing their efficiency to a certain degree, had the advantage of enabling them to be used in practically any situation, other than 50 volt

because there is no supply, was made to be of 10, 20, 30, 40 pieces when the medical supply plates 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

At the outbreak of war, various Albert outfits were supplied to all hospital ships commissioned and, it being recognized that under the conditions which exist there were of more value in those establishments than in ships of war, a certain number were withdrawn from ships and supplied to various naval bases, Royal Navy air stations, etc., including such places as Corfu, Brindisi, Malta, and even the Russian Imperial Russian.



(5) *A. & B. X-Ray Table.*

This is now being supplied to naval hospitals and Brindisi a description is given. It is a portable table, the table stand and holder being the most distinctive feature. It is manufactured by the Medical Supply, London, Ltd.

The railing of an upright stand may be easily removed, leaving four corner supports, which stand at top and bottom, preserving a frame on which a specimen may be displayed. It is undesirable to move the patient into the upper corner of the lower longitudinal beam of the table and vice versa. A convenient principle is to. At one end of one side is a step to



prevent it from sliding off, at the other end is a short extension piece II hinged to fold back against the end of the beam when not in use.

The Table stand has a heavy cast T-shaped base, G carrying three wheels which fit on the rails on the longitudinal beam of the table. Into

The holder is supported, to make it stable in any direction by vertical adjustment, on the vertical movement *V* (Fig. 16) and is fixed in any direction by means of the screw *U* (Fig. 16) at the further end of the stem. The inner metal ring in which the diaphragm may be mounted on its own axis, but this should not be necessary except occasionally in the preliminary adjustment to secure proper adjustment of the diaphragm. This ring is fixed by two thick screws *W*, which engage radially from its circumference.



FIG. 16

A cylindrical support is supplied to fit the tube low point, the use of which enables the operator to turn it desirable.

The base and stem carrier *W* is in the form of an aluminum tray (Fig. 17) of round apertures at its center, and square apertures towards its outer surface. This is visible in the side of its stem at *W*, and is held by a hinged screw handle *X* at the further end of the stem.

The 1990s saw the large language processing community's growing interest in expanding the grammar to include domain- and task-specific knowledge. On the upper levels of the task hierarchy, we can find specific domains which a conversational agent is held to perform (e.g., customer

The glomerular mass of a human fetus 304 cm on the y-axis (Fig. 1) is fixed in position by short parts projecting from the two vessels at the sides of the tray, or, in some cases, as supported on pins fixing water in the water of the tray so as to act as lagers. The bases of the two main masses (internal renal, descending aorta and ectodermis) and also a small collected mass with posterior attached for use in histological. The outer surface is covered by a thick sheet of lead glass.

Protective glaze of head rubber are suggested which may be attached either to the table top or on the side bars of the table frame when the top is off, thus covering the space between the level of the table top and the frame. There may be moved along the table in convenient. The flaps that slide of the table adjacent to the table-stem project above the level of the table surface. The other flaps end at that level, so as to facilitate the handling of the material on the table.

The preceding description is adopted from Field (1989: 7, my Quora instructions), available at <http://www.kenfield.com/Quora>.

RESEARCH DESIGN AND METHODS

(a) The Swedish rule ready for use.—In England the glass was made of good heavy tallow and, previously, entirely German—the manufacturers in this country being negligible and dependent on the supply of German glass. Good Swedish glass tubes were on the market, but as imported later tubes were also to a considerable extent dependent on German glass. An interesting side light on the matter is shown by the fact that when America was badly struck with the war, and her sources of supply of German glass through neutral countries were seriously closed, she had to apply to this country for the formulae of the composition of glass best suited for the manufacture of air tubes.

Not long after the outbreak of hostilities, the steel of Germany's iron industry ran down and the warping demand for tubes had to be met by increased importations from America. At that up to 1916 the bulk of tubes needed in this country came from America.

In the meantime the French *ray* tape industry has risen and produced an increasing number of sales. These incomes were mainly from fairs in seasonal and in commercial. The quality of the glass was very variable, the metal parts were not sufficiently exhausted from standard glass and this meant was that the lifespan of the tape was very variable and if anyone was put on the tape, the vacuum broke down and the tape had to be re-exhausted before being open to be hot. There was also failure in the separating of tape segments, and perforations on

inside were numerous. In fact the state of affairs was serious for a time, not only as to the quality of the work, but the availability of tubes was a great source of anxiety to radiologists.

Recently, however, glowing responses by letters and representations, and aided by scientific tubes, such as the Institute of Chemistry, Glass Research Commissioned the King, Great Britain committee of the Department of Scientific and Technical Research. British manufacturers steadily improved and by 1915 they were producing tubes which could stand the strain of heavy work, and which compared very favorably with tubes produced in America and elsewhere.

In fact, the history of the British x-ray tube industry during the war has been one of constant working and overcoming difficulties of all sorts, and its successful achievement reflects great credit on the industry and on the industry. It is to be hoped that now it may be freely admitted and successfully welcomed all foreign competitors in the future.

(4) The Demand Bulbs—This is supplied to the x-ray tube vacuum factories by the glass makers, in the form of a bulb with a long cylindrical tube projecting from one end.

Formerly a French bulb, made 12 cm. bulb, i.e., a bulb blown hot without necessary protrusion attached to electrode, etc., fixed, and 8 1/2 inch. This is about twice the diameter of standard bulb, but was obtained through Holland, but as in Holland there was no x-ray tube factory the ultimate destination of these bulbs was becoming evident to the Germans and the traffic was stopped. Finally the supply of German bulbs through America was closed so that within a few days was obtained. The trade had therefore to fall back on either French, American or English glass. The French bulb was also expensive costing about 50s. per standard bulb, also these bulbs were not standardized, varying in diameter from 1 to 1 1/2 inches. The American glass had the disadvantage of becoming quickly deteriorated in working and was not satisfactory also the bulb was not truly spherical. England had always produced good heat glass but this glass was, at first, not suitable for the manufacture of x-ray tubes as the x-ray could not penetrate it. English heat glass as then made gave a film fluorescence under the action of the outside light and this was stopped by by x-ray workers accustomed to the apple green fluorescence, as they were unable to distinguish at night between a red and a hard tube. The problem of fluorescence was later corrected by the addition to the glass of manganese, which is the element necessary for the production of the typical apple green fluorescence.

In the meantime Mr. Robert Jackson, KBE, FRS had been conducting experiments on the composition of glass but noted the wrong color and in 1914, he produced the No. 22 formula which is used to this day with the original French glass.

This is essentially a potassium silicate with traces of manganese and

difficulties. These problems all arose to the same cause: (a) the electrical apparatus (b) the electric flow in the vacuum of potash (c) the use of unglazed thermoses (d) imperfect thermoses (e) this. As a compromise solution (a) is contemplated by the present set, the resulting glass has not satisfactory mechanical properties. It was found that nitrogen and water vapour were liberated from the glass, with the result that the vacuum was variable and the tube variable in working. A intermediate glass was also used but this also under working conditions, released water vapour which had the effect of making the vacuum objectionable. At the end of 1939 the Ministry of Munitions was induced to liberate a small quantity of potash for the x-ray glass industry, and from then matters began to improve and the following year sufficient potash was being produced for the needs of the industry, the problem having been solved by its electrical properties from the dust on factory chimney (a). As to the actual manufacture of a set, tubes difficulties were encountered in the making of sealed tubes. One firm took up Jackson's formula but the tubes were made blown and the working was rather rough which gave rise to difficulties in the 'making up' of the finished x-ray tube. Another firm used a formula of their own similar to Jackson's and, being satisfied in producing experimental tubes were able to produce satisfactory tubes. In addition to the glass there are several other factors on which depend the production of a satisfactory x-ray tube.

The Cathode—The essential is the use of absolutely pure aluminium as an anode. In the old days when lighter materials were employed the anode was not so clean but the use of higher power currents and with them the necessity of more intense electric fields brought into view more defects. One was the production of a rather dragging or the cathode. This was found to be due to presence of sodium or less impurities on the metal. Pure aluminium does not flow readily when making coatings of it and the workers had found that the addition of the sodium or cesium, improved its ductility and they added these impurities intentionally to make their work easier. This had to be strictly forbidden, but even now occasional serious failures of cathodes giving evidence of their impurities is proof of the fact that they are supplied with aluminium produced in Canada, stamped and granulated by the Government to be absolutely pure metal. To emphasize in this factor of purity that special care should have to be kept for cathode making as, of course, are used in which copper aluminium had been found sufficient impurity remains in them to contaminate the upper metal.

Another defect was the production of black bands on the glass in the neck close to the cathode. There are now 3 cases to be due to the presence of lead ions, to intensity is dependent on the dimensions of the cathode. The combined effect of these defects was overworking of the glass and had occasional failures in that region. Prior to the discovery of the real cause of the defect it was thought to be due to the presence of an heavy

current flowing on the inside of the wires of gas, as finally, pressure is exerted on the vacuum—the metal at the end of the tube being caused to flow into the ring joint.

When put in the water bath of the vacuum chamber, the electrode plate supports a cathodic copper is not oxidized by the film present. It acts then as an anode in vacuum. Thus, on the right being heated, is driven off and is deposited on the plate of the tube drawing it from the cathode. The presence of vacuum also interferes with the chemical conductivity of the copper.

The Regulator—The type which is now almost universally used is the so called "oil" type. The oil used is pure hydrocarbon which surface film which when heated in the passage of current the right the system both gives off C_2H_2 gas. It has the chief advantage that when the tube leaks down after use the gas is absorbed by the oil and the whole system is at a lower high degree of exhaustion.

The Vacuum—Exhaustion of tubes can be and is carried to a greater extent than formerly. Tubes are now produced which come off from a complete vacuum and which, before they can pass a current in oil, have to be exhausted by the production of gas or electrons from the cathode. The advantage of this is greater reliability and steadiness in output, due probably to the fact that in place of the reaction of metal gases which formerly distressed there is now available from the regulator a sample gas which produces the requisite stream of ions, electrons and equal electrons.

The exhaustion of a tube is not a simple matter of pumping out all the air. There remains two possible sources of gas, namely the glass of the tube itself and the metal of the electrodes which under the influence of the heat produced on running the tube may give off sufficient gas to reduce the vacuum to a point below which a ray of painted tube seems to be evolved. Therefore connected with the exhaustion two other processes are going on. The tube is placed in a gas oven in which it is exposed to a heat treatment to drive off from the glass any gas or water vapour contained therein, but not that of causing softening of the glass. At the same time a current of from 0.5 to 2 milliamperes is passed through the tube. This heats the metal of the electrodes and causes the liberation of all residual and latent gas on them. This process goes on for about ten hours, at the end of which time the vacuum chamber can be opened in vacuum stable and permanent when the tube is finally sealed off.

The vacuum pump used is usually a two-stage rotary vane type 3 cylinder pump which is backed up by a 2 cylinder oil pump. In the pump circuit is added a bath containing sodium, potassium or phosphorus, which removes all residual water vapour by simple chemical action.

(H) Report on Proceedings of the Sub-Committee on X-ray Glass by
 portion of the Standing Committee on Glass and Optical Instruments
 of the Department of Scientific and Industrial Research

This sub-committee was formed and held its first meeting on January 17, 1917. Its six meetings were held subsequently on February 20, 1918.

Professor Sir Herbert Jackson, B.Sc., D.Sc., F.R.S., was elected Chairman, and the following were members of Committee:—

Dr. Isaacson, Reader

Dr. Crane

Mr. J. Munro, Lecturer

Mr. Davidson (Electrical Engineer)

Professor Fowler

Mr. H. T. Grange

Mr. A. Smith

Dr. Latham

Lawrence Murray

Optician Davidson

Dr. Fyfe

Technical Editor

Professor Macmillan

Dr. Ellis

Staff Surgeon, Queen's House, R.N. (see
 report on February 20, 1918, pp. 54-55)

Surgeon General, R.N.

Mr. J. C. Murray, Glasgow

Dr. G. J. Smith

Dr. S. S. Williams

A Memorandum prepared by Dr. Isaacson, Reader, Major Reid, and Dr. Williams, was submitted to the Department of Scientific and Industrial Research. In their reply the Ministry of Munitions proposed as urgent an experiment was proposed the proposed investigation the aim of which was the improvement of the process of fabrication of a ray tubes and the improvement of tubes and they undertook to provide the necessary apparatus, material and facilities before as concluded that the Committee supplied the necessary expert supervision essential to the satisfactory performance of the research.

The Committee took the views of Dr. S. S. Williams for fully acceptance and Dr. H. T. Grange for full acceptance for the investigation. The Ministry of Munitions provided accommodation for the experiment at 117 Piccadilly and arranged for the necessary equipment with certain modifications of ray apparatus.

The experiments and investigations may be divided into the following headings:—

(1) Glass.—It was reported that tubes made of English glass, as then supplied, softened rapidly under heat and Professor Jackson stated there could be no doubt that this was due to the release of water from a layer contained in the glass under the influence of cathodic rays. It was agreed that the Ministry of Munitions be strongly recommended to make their arrangements to obtain a sufficient supply of potash glass (potash 20 per cent.) from French sources equivalent to a formula supplied by the Director of Chemistry, Queen's House at Committee on 1914.

On May 1, 1917, Dr. Williams reported that he had found a type of French glass to be more easily exhausted than a similar tube of English glass. Professor Jackson offered to examine a specimen of the French glass. On August 1, 1917, Dr. Williams reported that the all glass (English) exhausted very well but that a steel safety channel would be required for the new work.

On September 18, 1917, Dr. Williams reported that (a) no tubes of potash glass had yet been received. (b) three or four glass tubes had, been exhausted and were satisfactory as far as such small tubes could be made. (c) one French Potash tube, glass tube had been exhausted. It was very close to exhaustion but showed the least sign of any work. The glass was, however, a fault from the glass makers' point of view.

Colonel Reid stated that since the last meeting of the Sub-Committee the desirability of the performance of English ray apparatus had become an English

of being put into a ray heater on account of the difficulty of making such the heater as was required. By altering the components of the current, controlling the method of making the delivery was achieved at a great expense. He had to be very particular with such tubes through the vacuum, first, as a vacuum is necessary, and there were the heat effect on an account of a very small percentage of being that contained, the heat of substances was usually, principal and the temperature required was to help in to decide the regulation of gas in the gas in the gas.

In the end of February, 1918, among the last approaching current from London Dr. Williams had substantially to change his appointment and he made the following report. The valuable work had already had its several improvements and improvements in the apparatus had been completed on the basis of the work.

(1) The 1000 vacuum was made better than the 1000 vacuum. On August 1, 1917, Dr. Williams reported that a satisfactory work had been completed and the temperature of a cylinder of a pressure of 200° had been raised to a greater vacuum than 10° between top and bottom. The present delivery had proved to be the maximum through the vacuum of the cylinder and both had then had been maintained continuously.

On February 20, 1918, from reports of the progress of the Ministry of Medicine Dr. Williams reported that a satisfactory work had been completed and the temperature had been greatly improved by the maintenance, but a number of increasing the temperature was not yet in general use. It was probably on account of the change in the rate of the temperature in the performance of every heater had been observed.

(2) The 1000 vacuum was made better than the 1000 vacuum. On May 1, 1917, the question was raised and Dr. Campbell reported that he had to change the 1000 vacuum heater, because the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Campbell reported that he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Campbell reported that he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Campbell reported that he was informed that the 1000 vacuum heater was not yet in general use.

(3) The 1000 vacuum was made better than the 1000 vacuum. On February 1, 1918, after discussion of various types of regulation it was decided to make a 1000 vacuum heater in the Ministry of Medicine. The 1000 vacuum heater was made better than the 1000 vacuum heater.

On May 1, 1917, Dr. Williams reported that the progress of his regulation, well agreed to place it at the disposal of the Committee's investigation. On August 1, 1917, Dr. Williams reported that he had not yet succeeded in using the 1000 vacuum heater but he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Williams reported that he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Williams reported that he was informed that the 1000 vacuum heater was not yet in general use.

On December 1, 1917, it was reported that the 1000 vacuum heater had been tried with various substances and with various gases and it was found that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Williams reported that he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Williams reported that he was informed that the 1000 vacuum heater was not yet in general use. On August 1, 1917, Dr. Williams reported that he was informed that the 1000 vacuum heater was not yet in general use.

The February 1981 issue of *Williams* reported that when the model is used to estimate individual and district-level variables, the tendency is under to be more efficient, an assessment of which is more than adequate to the value, most of the time, because of the fact that the model is so simple.

(2) *Values*.—(U) Figure 1, 1977, the *Values* data, according to a preliminary reading and it was agreed in conversation by the Ministry of Transport that it covered the sign that specifies length of value is both in meters and kilometers, currently only, used to be used, otherwise the results may be affected and it is this case in the conversion of unit value.

The United States appeared to be wavering on sound but effective. On Mr. Williams' suggestion, underwriters on the insurance of the silver had been produced by some nations and the new silver was under trial. The American silver had not always been sold without hesitation, and was sometimes badly damaged. Mr. Williams said Mr. Williams to report, also in the United States and Germany. He thought that the two companies could be used to see that the current business of silver was conducted in all directions.

Dr. J. H. D. Williams, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991

At the beginning of the run the wolf had to hold the stretched pack length when the current was out in alternate downwind blows, i.e. 180°. A wolf which gave a single 180° upwind (early passivity) provided the equivalent pack length in the right direction and still takes credit. Although this is the case of the current, it is limited to two directions only.

The authors believed it is necessary that the high frequency of cases should be recorded. An examination is found that a series of 10 cases with a good series of about 10 cases would be a suitable series, and 200 cases would be a good series.

[illegible]

It seems contradictory to us at first that, with results so mixed, through the votes and decisions of the members on the right it should be as important a bill with every subject going to be an omnibus. These show the value of membership on a top level and encourage each and every participant to assist the members in the decisions to give the reform. With very little input, such as the Lindbergh case, more must be placed in order otherwise they may be spoiled unless brought forth in a useful way.

The following are observations on values listed with arguments for these
non-probability: —

(4) *Other Judge Tests*—This differs from all others in the fact that the results are mostly self-regulating, owing to the opposing effects of phagocytosis and hydrolytic enzymes under the influence of the discharge. Mixed pellets of phagocytosis and peroxidase are not stable in the tube and coagulum between

these vapours under the conditions as stated below and upon the gas p . Three of them are more rounded probably and they were not exposed over a glass window. In some special cases where the valve together was not installed, they were placed in the inside tank which seems to be the most important in the design. These results may be summarized briefly. (1) These curves on the right decrease slowly but have equal to about 4 or 5 μ . (2) The valve curve p , that is, of the gas subject equal number n of the same was in two directions or essentially large of μ (10 μ), whereas for other types 10 μ is small. (3) They can easily be replaced without major, provided the volume of the chamber does not exceed certain limits. (4) The valve regulation is nearly perfect for most of the together and finally as is stated above that with well in practice.

Some experimental endographs did not look them as satisfactory but it was found that where they proved more satisfactory they were being used with sufficient work with a related high number of mean and high numbers in the secondary.

(4) Table 1 gave valve rates of 2.1, the carrying capacity being up to 12 milligrams for several minutes and two or three per cent satisfactory ventilation. It resulted from the authors that after suitable, complete they obtained after a few days, one whole or others they, incidentally very rapidly. These variations are, however, due to study cases to look at themselves as endographs.

(5) Table II gave a pair valve rates about 1.1, but it appeared satisfactory in some with an 11 μ ray like and one through. Table 3, the variation was variable being mostly too high, consequently the good condition was obtained at the expense of a high percentage in the right direction.

(6) Table 4 consists of two successive serial endographs on an exhausted bulb. The valve curve was very small about 0.1 and the speed and amount were usually affected considerably, yet the curves seemed, admirable as a bulb's large carrying capacity.

Coming to the discrepancies between the results of the speed or current tests and the actual performance of the valves in practice, a large number of experiments were undertaken and the conclusion was reached that the valve seems dependent on the following factors:—

(a) The position of the valve seems to be large and it must be placed so as to allow the vapours given in the shape of the better curve.

(b) The resistance or friction of the stream coming from the interior of the outside tank is well defined point.

(c) The greater part of the pressure discharge occurring from the inside tank keeps the walls of the bulb and a discharge takes place where the vapours give nearly round, the work. The valve works best when in the position. The resistance is also greatly improved by using a small valve in a substituted tank—then in practice, the ideal source of valve seems to be the large type—had the results observed the life and estimate the carrying capacity to be given as when that most modern were proper to serve the valve which by other means, and the same most type of valve in a large, slightly smaller than placed at the entrance of the work tank. Dr. Williams found that valves with numbers or other very low calculations—these share with other forms, and though the reason was fairly above, namely that it was beyond current best part, this form of phosgene will tend to have the most reliable character and so provide a path of small resistance. A complete valve would appear to be a better type.

Valve tubes of the present form are frequently a source of great trouble. They can be replaced by certain forms of substituted valves when necessary but it is not less than is applicable when the photograph is required, and it is found when the resistance and is replaced by a standard. The most satisfactory form would undoubtedly be one depending on the same principle as the Cookridge type valve. The one would be much greater but it would repay the by its longer life and the decreased resistance of the a ray bulb.

straight with 120 down the protection land rubber. This was to be made in two half hours.

(1) Heavy, 24 mm. thick, used for hand plate holders. It is heavy enough readily at 4 lb to hold a given 10 mm. square with rough 120% protection.

(2) Light, 12 mm. thick, enough for a press and gloves, it is light enough readily at 4 lb to hold a given 10 mm. square 10 mm. square with rough 70% protection.

In each case of the density of the hand rubber the greater the speed of the work, the more it is to be used. The material does not pass as a chemical relatively material to afford an alternative path for the discharge under working conditions.

Further the hand plate is to have a minimum density of 24 grammes per cubic centimetre and to be as, as nearly as possible, 4 mm. in thickness.

The other part of the work of the first department (Laboratory Committee) was to control the placing of the orders of the various departments, through the supply department of the Ministry of Munitions, as to the supply of material, and as to the nature of the material, which would have to be made in the work, and as to the nature of the material, which would have to be made in the work, and as to the nature of the material, which would have to be made in the work.

The Committee was still at work when the Committee moved and was then in at present material, but it is to be hoped that the valuable work, done may be successful and well-performed.

So far as the Navy is concerned, a satisfactory system has been developed for the supply of 2 mm. tubes and has also been given for the last three years.

All tubes are at present from the Ministry, in the D. M. Munitions Supply, Royal Victoria Dock, Deptford, where they are made of and tested by Mr. F. W. Rogers, D. M. Munitions Supply, Deptford. Any tubes not up to standard get returned to the Ministry. The satisfactory tubes are tested at once at Deptford in six months, during which time any kind of tubes are likely to be needed. They are then re-tested and if all satisfactory are passed on forward. Now as a result of this system, practically no tubes are returned to Deptford as unsatisfactory.

(3) Gas Tube

Since early in 1918 these tubes have been made in the D. M. Munitions Supply, Deptford, and Plymouth. It is in the line of these for which tubes that tubes development and improvement of 2 mm. tubes may be expected. Since the early type was produced improvements have been made in these tubes and delivery. Also recently a modified type has been produced capable of "self-ventilation," which is of importance in it permits considerable simplification of the apparatus necessary for ventilation of the tube.

The great advantage of these tubes is that their vacuum can be maintained exactly and therefore the tube will always produce a definite class of rays, variable as well as their exposure, by use of definitely standardised. The other type of gas tube was not capable of exact regulation and was could cause the action of obtaining results consistently.

The two outside type of tube may therefore be expected to eventually replace the general use of the other gas tube. At present it is not made in America, although I hear that similar tubes are now being produced in Germany.

It is of importance that these tubes should be manufactured in this

chloroform, however, should be dependent upon imports for the domestic demand, and it is to be hoped that the Department of Commerce and Transportation will consider the necessary steps to limit the importation of chloroform to the minimum necessary for the special apparatus in health, etc., stations.

The conclusions of Volney Davis, published in this subject by 1875—

(7) Plans and Policy

(1) If the chloroform tanks were made of glass for a long work as it was chosen, then they possessed several advantages over planches was more numerous, namely:—

(a) lightness for transportation (2) economy in storage space, according to the number of tanks (3) comparative cheapness of glass.

(4) questions with regard to the durability, and the final decision would supply planches in preference to glass for the following reasons:—

(a) The Government has promised to support the struggling British glass industry in this matter.

(b) The British industry was shared entirely on American tanks and exports, however, be discouraged as much as possible to encourage more space tankettes it was desirable to restrict as much as possible the export of tanks of British glass.

(c) It was thought that if glass were adopted the increased demand would create sufficient price with the result that no company would be concerned with the transport.

II—TECHNIQUE.

(a) Location of Foreign Bodies—General Methods Employed

(1) METHODS EMPLOYED TO LOCATE FOREIGN BODIES.—That as far as well known in most descriptions. Used practically entirely at Lintane with 50 per cent. success—also at Kladno and Kladno.

With this method, as with others, it is assumed that the foreign and the sub-deposit should work together in full collaboration. The following simple rules do much to ensure successful work:—

(a) The foreign body should be located in the position in which the planches will be placed at the operation. This is of primary importance, as the precise position of the foreign body is readily changed in relation to the markings by any change in the position of the tank.

(b) Before the operation the foreign body should be examining the negatives and discussing the work with the sub-deposit, come to a definite realization of the position of the foreign body. Many companies obtain a new work only the best view of release the foreign body is.

(c) The sub-deposit should, if possible, be present at the operation. Not being actively engaged in operating, the sub-deposit is more likely to

within any deviation from the correct line of attack and, by increasing such, materially aid in the successful issue of the operation.

(3) **Illustrations.** **METHOD.**—Sergeant Lieutenant Commander A. Hedberg, R.N., used this device extensively at Plymouth and at Manila. The part is secured and the extensile placed ventrally underneath the finger body. Two marks are placed on the part, one above and one below in line with the bullet. These points are marked on the skin (A and B in fig. 11). The part is rotated through a few degrees and the process repeated, the points C and D being marked. A strip of sheet lead about one third of an inch wide is now incised to the bone, and the four points A, B, C and D, marked on the lead. The lead strip is then removed from the body or limb and its curve accurately traced the four points being marked on paper. The points A and B, C and D, are joined, and the



FIG. 10



FIG. 11

intersection of these lines at *F* represents the position of the bullet. A line is drawn from *F* to the nearest point *E* of the curve, which is the path of the skin nearest to the bullet. The distance between *E* and *F* gives the depth at which the bullet is situated. The distance between *E* and *C*, and *E* and *D*, is measured, and the point corresponding to *E*, is marked on the skin with silver nitrate. The rotation of the part prior to making the second measurements must be done through only a few degrees, or otherwise it would be impossible to remove the lead strip without distorting the curve.

(4) **THE GIRD.** **CONSTRUCTION.**—The Army Medical Department pattern is the being now supplied to large and subsidiary naval hospitals it is advisable to describe the method of hooking by the "gird" hooklets which is supplied with it, as it is not yet published in text books.

The gird is fixed on top of the tubercles, which is on the under surface. The gird is a thin aluminium plate, with three quadrilateral bars of brass pasted at their central end.

These bars are set at a distance of 0.15 cm. (2½ in.) apart. The

distance from the tube center to the upper surface of the bars on the grid plate is 21 cm (81 in). These measurements should be fixed. The distance between the bars should be one quarter the distance between the tube center and the grid plate. The bars should be transverse to the length of the tube to allow the observer of the tube box to be longitudinal bars being the right convenient way.



Layout of bars converging at tube center



Fig. 11—Front View

The construction is made of clear sheet aluminum, and has as its center a small hole which allows of the stem being inserted through it.

The screen is provided with shadow shaft extensions, which are visible in the center subt of the screen. The extensions are made of bent brass bars with loops at the central end of legs, which move on a flange on the frame of the screen. On the latter flange there is marked a centimeter and each scale from which the distance between the extensions can be read.

Instructions for Extension of Bars on Frontal Box

(1) Choose a prominent and well-defined point of the large body shadow, and, by moving the tube box, set the point of the shadow of one of the lateral bars in this point, looking along the edge of the bar shadow, so as to make the setting accurate.

Note—(a) To get good definition, the lens should be as close as possible to the upper side of the table top. (b) There is a little wiggling and usually, the point of the lens point in a certain direction, so that the long edges of the lens face the selected point of the large body. This may easily be arranged by appropriate setting of the post plate on the table top, as the change is made in its way the opening is any one of four directions. (c) The lens must be set at right angles to the proposed shaft of the table-top.

(d) Register position (f) by setting one of the indicators attached to the movement across in line with the pointed edge of the bar-shadow (see diagram, first position).

Note—The screen should be placed so that the indicators, attached to it are turned to meet the bar-shadow point to point.



FIG. 17.—Diagram 3rd position.

(i) Move the table-top so that the shadow of the central bar approaches the large body shadow.

(a) If inverse of the table-top, is indicated continue this movement till the shadow point of the second lateral bar touches the large body shadow, and set as in (i).

(b) If inverse is wanted, the table-top movement may be checked when the shadow point of the central bar touches the large body shadow, and the setting made as first position.

Note—The movement of the table-top should preferably be made parallel to the length of the table, as the movement will then be indicated and working along the edge of the bar shadow will be more movement.

(c) Register this second position (f), a or b, by setting the second screen-indicator to the line of contact of the shadows, as in (f). (See diagram, second position).

Note—The screen and potenti must be fixed steadily about the shadow shaft as being recorded.

(d) Measure the distance between the two screen indicators by scale on frame of screen.

(1) *Measuring the depth of a wound channel.*—By fig. (3) A, the arrangement has in effect the two lateral bars, (B) (C) (D) and a wedge have been made to the central bar, and the inset (E) is the diagram second position A and (F). This wedge indicates the depth of the foreign body from the bottom of the wound.



FIG. 3. Diagram (continued).



FIG. 4. Diagram (continued).

When using (F) during the examination the screen is held in the skin externally from the foreign body that reach well outside (3) (4) of the foreign body from the skin. But if the screen was not in contact with the skin the examination was between screen and skin must be subtracted from the distance. (3) (4) is the distance the depth of the foreign body from the skin. (3) (4) is the measurement from screen to skin and the reading of the skin externally over the foreign body should probably be carried out after both measurements have been taken as described above. If anything has been carried out as at (4) B, the foreign body is already externally below the centre of the screen, if at at (4) A, the take has must be moved back to its central position without interference with the indicators. This order of procedure completes the two fold process of localization, with one continuous rotation of the wrap tube and creates a second deflection of the screen.

(2) *Translocation.*—This was employed in many cases to enable the subject to give a correct indication of the relative positions of the foreign body, and the various bony landmarks.

(3) *Localization of foreign bodies in the skin.*—Several apparatus and method were employed for this purpose with notable success, especially in Chatham. (A description of this method will be found in *Journal of Radiography*, vol. 1, p. 151.)

(4) Spinal Fluid Examinations

These examinations were greatly increased in number during the war the incidence of gunshot and stab wound conditions having increased partly from the lowered standards of physical fitness in new recruits and partly

from the past diet and hardships arising from war conditions. The various meals employed were as follows:—

(a) *Bread and Milk*.—Two ounces of bread or about equal oat cake or if cakes are placed in a bowl from which the meal is to be taken. Eight ounces of ordinary or malted milk are boiled in a separate vessel with 1 oz. of barium sulphate or 8 oz. of barium sulphate; this mixture is stirred and poured over the bread. Sugar is added to taste.

(b) *Flouridge*.—Seven ounces of porridge made from the finest oatmeal with 1 oz. of barium or 8 oz. of barium milk, to make the total bulk up to 15 oz. Sugar is added to taste.

(c) *Distillermilk*, used as a vehicle, is diluted to 15 oz. with the oatmeal and folds of the stomach and intestines, and to demonstrate the appendix is totally every case examined.

Enough subcarbonate 50 grammes (or barium sulphate in increased quantity).

Sugar and water, 100 cubic centimetres.

Distillermilk.—The form of sugar meal most commonly used in naval hospitals has recently been modified, a prepared barium meal, introduced in 1916 by Dr. Mollette & ray Department, France at Wake Hospital, N., and is prepared by Messrs Allen and Burroughs Ltd. It is made of 75 per cent of pure barium sulphate with 25 per cent of a solution of sucrose, anhydrous, desiccated milk, &c.

The whole is packed together into an ampoulette provided in such a way that there is no pressure and there is great resistance in the solution. It is supplied in boxes containing 2 oz., 4 oz. and 8 oz. of barium respectively the 4 oz. size being the one most commonly used. The preparation of the meal is simple—all that is required is to rub it up with a little cold water into a paste, or a small pan over a spirit lamp, add some more water and bring it to the boil, when on allowing it to cool for a few minutes it can be administered. It is pleasant to take and always be prepared in the very room without each time troubling nurses to have the material weighed out in the dispensary and milk &c. and on account of the thorough absorption of the material, the delicacy of any investigation in the contour of the hollow viscera are more readily discovered.

Remarks.—Flouridge somewhat increases the normal motility of the stomach and many think that because in the first material is not for the following reason. With it the motility of the stomach is increased, followed by an increased flow of well contrasting rhythm in the duodenum and small intestine. The action is already visible on tape in an hour and a half after the meal. The small intestine is expanded and the ascending colon filled much more quickly. The dose of barium is less expensive. There is a saving of time from more rapid action and, finally, it is cheaper. Whenever the form of the meal, the bulk should be about half a pint. The

meal should be taken as nearly as possible on an empty stomach. The appearance of other conditions should be given within thirty or an hour of the first examination and if the bowels are not opened naturally an enema should be given on the morning of the examination. A routine which has been found useful as a standard for barium meals is as follows:—

- (1) Screen examination of esophagus and stomach during the taking of the barium meal by the mouth.
- (2) A quarter of an hour after the meal screen fluorium is used, prone, supine and oblique positions followed by plates as necessary.
- (3) One hour after meal screen and plate for degree of gastric translocation and observation of small intestine.
- (4) Two hours after meal screen and plate. Stomach should usually empty and stomach well filled.
- (5) Four hours after meal small intestine usually empty. Descending colon usually screen by apparatus. Plate general condition.
- (6) Seven hours after meal. Large intestine visible as far as sigmoid flexure known by apparatus. Plate general condition.
- (7) Twenty-four hours after meal. Large intestine filled as far as rectum. Plate general condition.

Thereafter plate at longer intervals as required.

Screening is of great importance for esophagus, stomach mobility and retching pylorus and descending colon in early stages and later six to eight hours after meal for observation of the appendix as to size, shape and position, presence of kinks or of adhesions to other structures.

There should be taken as a rule with the patient on the erect position unless special indications, e.g., demonstration of fecaloma etc. require exposure in the supine or other position.

PRELIMINARY INSTRUCTIONS TO PATIENTS IMMEDIATE TO THE PATIENT'S HOME

Amel polycrystall structure

Patient's diet should be at least 2 ft. from antacid diet.

Incorporation of a thin aluminum film.

After technique of the opaque meal as devised by Dr. Richard Knorr has been adopted in the large meal technique and it has the advantage that the records can be readily referred to, and the physician or surgeon may have at hand a complete record of the examination.

The method consists of taking images from the radiographic plates and a pantograph is employed to reduce the images to a convenient size on a standard chart on which are simply outlined the diaphragm, rectum and pelvis. The spread table and the method of superimposing the diagrams are described in Dr. Knorr's book "Radiography," pp. 154, et seq.

Barium Intra.—Thoroughly mix 100 gram of warm water with 500 gram of broken and 150 gram of barium sulphate, then add 500 gram more of water, and finally 150 gram of barium. Introduce through a wide metal tube from a double bag, above it to flow on by gravity.



FIG. 10.—Front after meal.



FIG. 11.—Stomach empty, lungs empty.
The stomach is shaded with a stippled pattern.



FIG. 12.—Lungs empty, stomach full.
The stomach is shaded with a stippled pattern.
The lungs are shaded black.



FIG. 13.—Lungs full, stomach empty.
The lungs are shaded black.
The stomach is shaded with a stippled pattern.



FIG. 14.—Stomach empty, lungs full.
The lungs are shaded black.
The stomach is shaded with a stippled pattern.



FIG. 15.—Lungs empty, stomach full.
The stomach is shaded with a stippled pattern.
The lungs are shaded black.



Fig. 22.—Stomach and liver shaded black. The liver is shaded grey.



Fig. 23.—Stomach and liver shaded black. The liver is shaded grey. The stomach is shaded black. The liver is shaded grey. The stomach is shaded black. The liver is shaded grey.



Fig. 24.—Stomach and liver shaded black. The liver is shaded grey. The stomach is shaded black. The liver is shaded grey.



Fig. 25.—Stomach and liver shaded black. The liver is shaded grey. The stomach is shaded black. The liver is shaded grey.



Fig. 26.—Stomach and liver shaded black. The liver is shaded grey. The stomach is shaded black. The liver is shaded grey.

(3) X-Ray Treatment

Even treatment has been carried out chiefly by *collimated beam* technique. Treatment of the entire nose has at a rate of increase in interest doubled (1913-1915) partly because the nasal malignancy which it will destroy is on an average 45% partly because the entrance of age do not make (1913-1915) the need, the readiness of patients for service and the readiness of the Academy between such as the Hunter Section and the Mammals Marine, in which the standard of physical fitness is not so high and in which the age limit is higher, have of course enlarged the scope considerably.

The hospitals were not fitted with special treatment installations and any treatment had therefore to be done with the cost which was so greatly costly constant use for radiographic work. This naturally diminished the time which could be allotted to treatment. The constant crowding of patients in other hospitals or hospital beds for fresh cases cultivated against a number of cases being treated and also prevented many cases from completing their treatment when it had been commenced. In some of these drawbacks, a considerable amount of treatment was undertaken and in a number of them with satisfactory results.

Estimation of Dose—The dose of x-rays administered is estimated by a combination of the indirect method, i.e. the quantity of current passing through the tube measured on milliamperes and the direct method, i.e. the use of Roentgen's parallel. These are made of human placenta, epidermis and change colour when exposed to the action of the rays. Under this the apple green colour changes gradually to red and red-brown and by experiment the exact time has been found which the parallel required after exposure to a dose which caused the hair to fall out. This is called unit "H" and a table showing the colour is supplied with every fraction of Roentgen's parallel. Unit "B" therefore represents when a skin referred to as a *Roentgen's dose*, which means, epidermis but which does not cause the erythema, which would be produced if the treatment were prolonged beyond this limit.

The parallel should be exposed on a thin sheet of metal at a distance from the cathode equal to half the distance between the anode and the skin of the patient. It should be protected from the action of daylight which delays the change of colour, and when convergence is made between it and the standard, this time should be done in a weakly natural light.

It is essential to bear therefore must be placed at least 2 cm from the tube otherwise it may be permanently discoloured.

Precautions—Adjacent parts of the skin not requiring treatment can be protected by leaded rubber or lead foil under which it is advisable to place distance better to a further protection from the secondary radiations produced in them.

Filteration has to be used when repeated doses have to be given for

treatment of deep seated conditions: to protect the skin from the X-ray which causes erythema. The filter most commonly employed is, black aluminium in thickness of from $\frac{1}{16}$ mm. to $\frac{1}{8}$ mm. In superficial lesions $\frac{1}{16}$ mm. filter may suffice, whereas in deep lesions, where deep penetration and large doses are required the thicker filter should be used. The filter is best placed half way between anastomosis and skin so that the distal end of the filter should be placed on the side of the filter distal to the tube.

The Tely should preferably be fixed over the treatment of superficial lesions such as myxoma, as lower voltages are produced and the chance of a severe skin reaction are therefore diminished.

The introduction of the Goldsby tube in which the degree of hardness can be regulated as will have greatly improved our control of the dosage.

DISEASES MET WITH DURING THE WAR

Scrapes.—Technique employed is that of handkerchief as employed by Dr. Anderson and called the "Scrapes method". No splintment or fixed band bandages are necessary and adjacent ray applications are made in such a way that, at those parts where overlapping does occur, the incidence of the rays is at oblique and as much further from the source that no excessive dose is given. The hair is clipped short over the whole head. A parallel dose is given in the following five pieces as necessary:—

- (1) 14.5 in. behind the frontal margin of the hairy scalp.
- (2) 1.4 in. above the centre of the flat area which forms the upper part of the forehead.
- (3) just above the hairy border of the scalp at the lower part of the temples.
- (4) on the left side just above and in front of the ear.
- (5) on the right side just above and in front of the ear.

The forehead and eyes, the ears and the neck should be protected by treated or leaded rubber. The anastomosis should be $\frac{1}{4}$ inches from the skin, but if large telangioma and then definite pain be experienced to allow the parallel to be placed half way between the anastomosis and the skin.

The hair begins to fall out about the fourteenth day and depilation should be complete in three or four weeks. During this period the scalp should be washed with soap and water once or three times a week. A loose skull-cap should be worn and a mild antiseptic ointment applied, *et c.* till all the hair falls out: the cure is still incomplete.

Scrapes is rather more difficult to deal with owing to the erythema, which is frequently exaggerated and care must be therefore exercised in a mild uncomplicated case one half parallel dose is generally sufficient to obtain a cure.

In severe cases attempts should be made to check the sepsis by anti-septic lotions or ointments. Gossell, at Harker found various results in this stage. Chloroform solution is also useful in checking the sepsis, owing to its bactericidal action. When the inflammatory process has

should a full parasite dose should be given to secure depletion—without which a complete cure cannot be expected in bad cases.

Parasite—Acute cases too rare suitable for a ray treatment, but considerable success has been attained in subacute and chronic cases. All results should be partly covered, and the surface cleaned with iodoform acid. A full unfiltered parasite dose may be first given, followed after a fortnight by 1-parasite doses through a 2-5 mm. aluminum filter. Some workers prefer to use the filtered 1-parasite dose throughout, and at frequent intervals.

Parasite—Good results have been obtained in this disease by giving 4 to 1 parasite doses, filtered and repeated frequently. The rash clears up fairly rapidly, and the tendency to recur can be kept in check later on by doses at longer intervals.

Eryema—The treatment of this condition is uncertain, but Connell (Glasgow) reports two cases successfully treated. When parietal infection is suspected a full parasite dose may effect a cure, but as other cases smaller doses and filtered, are probably the best, along through their stimulating effect on the skin and hair follicles.

Indurated sores are considerably stimulated and cleared up by a very faint dose. Half-parasite doses through 0.5 mm. aluminum filter frequently repeated is probably the best method of application. Connell found he got best results by continuing treatment with ray treatment.

Sore, and Itch—Excellent results have been obtained. Bradbury (Plymouth) reports marked softening and stretching, allowing free movement where sores had been limiting movement. A full parasite dose may be given without a filter followed a fortnight later by a second dose through 0.5 mm. aluminum filter, and smaller doses at regular intervals.

Lupus responds readily to a ray treatment, especially in cases of extensive ulceration, which clears up rapidly. Debriding rays should be used with 1 mm. aluminum filter and repeated doses given and continued for some time after the lesion has healed.

Indurated Ulcer—Connell reports cure in four cases, Bradbury in two. In superficial cases improvement is quickly obtained. In deeper cases especially when cartilage or bone is implicated, results are not so good. Bradbury reports a skin over marginated part of nose which two years slow in healing to treatment. Refractory a hole is seen; therefore graphylectomy must be resorted after apparent cure has been obtained.

In superficial conditions a full unfiltered dose should be given, followed by another in a fortnight's time.

If growth is spreading, treatment must be vigorous and further doses given, gradually increasing the thickness of the filter and using the finest penetrating rays. Connell obtained good results by continuing rubens with the ray treatment. This method, whether as a preliminary may also aid by increasing the surface circulation and promoting concretion.

In *exocrine* and *endocrine* exposures has been small, but post-operative treatment has been given to check its growth. In *metastatic* glands, and to a smaller degree in *non-metastatic* glands, every exposure has been situated in one or two cases of the disease marked diminution in the size of the glands has been obtained. The *exocrine* are the one of very penetrating rays. Filtered through about 8 mm. of aluminium.

Endocrine Glands.—Baudouin (Hippocratis) reports "marked improvement, and in some cases complete cure." The dose of treatment recommended is $\frac{1}{2}$ to 1 pacelle dose twice a week through a 0.5 to 1 mm. filter, many trials at high penetration.

Endocrine diseases.—Bradbury in this condition also reports "marked improvement, the dose of treatment being the same as above. He is of the opinion that interference of nerves within the, and of glands should not be operated on until any treatment has been given a fair trial. It will ease the majority of cases." Kuge states that the therapeutic effect of *x* rays often produces mild prostrations in the proximity of bones, this is probably due in part to the characteristic radiation emitted by the calcium of the bone enhancing the ionizing effects of the primary rays.

Hypothyroidism, with or without marked thyroid enlargement, has been brought into noticeable prominence during the war. Soldiers, first in the camp has been constantly prevalent—the conditions of modern warfare such as mental and physical overstrain want of sleep and food and constant over-exercising, furnishing the necessary conditions.

In the Army the physical factors have not been so prominent owing to the different conditions of naval warfare but the other factors such as overstrain, lack of sleep, and the constant menace of unseen water-borne dangers have caused a large number of cases. Many authorities believe the nervous system plays an important role in causing the changes, and that through it the functions of the thyroid gland are disturbed with resultant hypothyroidism.

Very treatment has undoubtedly a beneficial action in the disease. A series of forty-five cases was treated at M.N. Hospital, Chatham, and, although in a number of cases treatment was not completed owing to the transfer of patients to other hospitals, the results obtained were decidedly promising.

The routine adopted was the administration of $\frac{1}{2}$ pacelle dose through 1 mm. aluminium filter three times a week to the left and to the right of the thyroid, and centrally in week of work. By the end of the first week the pain was begun to ease down, followed later by a decrease in the tremor. The shorter the previous duration of the case, the quicker might beneficial results be expected. Very acute cases require absolute rest in bed and in these the dose should be administered more frequently. Cases with simple enlargement of the thyroid respond fairly readily, but in a previously established goitre, such good results were not obtained. Enlargement did

not appear to hold in the treatment except in the coldest stages, when lesions were distinctly red.

It is believed that as hard points of long standing full pustils become heavily fibrillar, give the best results. Generally no cases that responded to the treatment, definite improvement was obtained by the end of a month.

Ultraviolet Radiation

Ultraviolet radiation was introduced into naval hospitals in 1914.

Three types of lamps were employed. An Osram type lamp of the Tempus type was used and at first the electrodes were made of compressed graphite, as are containing tungsten. These gave an excellent light, but owing to spattering and formation of slag at their ends their output was

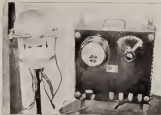


Fig. 1.—Osram type (1000 watt) quartz lamp.

irregular and in 1915 pure molybdenum, tungsten, with a 1000 watt, constructed with independent recorder housing and more regular output of ultraviolet rays. The new product was open to the air and the reflectors provided to increase the amount of rays reaching the part to be treated. A quartz dichroic reflector was used when a general effect was desired, and in more severe cases faced with quartz used to bring the rays to a focus where a localized or intensive effect was required.

The current used across the ear was 4 amperes at 110 volts. The exposure generally given was with the open arc (both plane reflections), two to three minutes at 15 in. distant. Following this exposure there was generally a reaction of varying intensity with erythema and a feeling of heat and throbbing. If no reaction took place the exposure was increased at the next sitting as the best results were obtained if a mild reaction took place. If reaction occurred, no further treatment was given till the effects had passed off. The extent of the facial area was more severe as the heating effect was much greater. At a distance of 18 in. patients could stand an exposure of about one to two minutes with momentary discomfort when a feeling of burning came on.



FIG. 26.—The F. 4 "open arc" treatment electrode used on the face.

At Hader the Poulsen treatment and lamp was used. The small composition of the electrodes is secret but is believed to be tungsten with a certain proportion of mercury added. The electrodes are cooled by a jacket in which cold water is circulated, which has the advantage of delaying the combustion of the electrodes, and also the arc produced is rather more steady than in the arc rod type, but, on the other hand, it is

most satisfactory and yet so portable and handy because of their low resistance (usually 250-500 ohms). The output of energy (in relation to the two types of lamp) is easily checked as given by radiograms taken. The same test of rays given with the Farber lamp is about five to eight centimeters or less at about 5 ft. in. distant from the quartz window in front of the ray.

At Plymouth an English made mercury vapor lamp was used. The rays are produced in a tube made of quartz or treated about a centimeter or so and containing mercury and mercury vapor. The expenditure of current is small, as it requires only about 1 watt per candle. The rays produced



Fig. 13—The Farber lamp.

differ from those from the other two lamps. It has a rich output of green blue and violet but does not produce such an abundance of ultra violet rays. The bactericidal effect of ultra violet radiations is limited to the middle third of the ultra violet spectrum, i. e., between the wave lengths of Δ 2,827 and Δ 2,535. The rays producing inflammatory reactions are also confined to the ultra violet region. The practical result of this is that in the lamp the bactericidal power is less and longer exposures are required to obtain the desired reaction.

LIGHT-ENERGIES IN ULTRA-VIOLET RADIATION.

Ultraviolet rays, when directed, may be directed together in the strong, and gentle, spectrum. Forwards to the exposure the light, for a small, is directed with more water to the eye being used. All cases which are gently removed and long taken to damage as little as possible the patient, especially with. Therefore take that when used light



Fig. 10. A Special Lamp for use of the eye.

ultraviolet rays, when directed, may be directed together in the strong, and gentle, spectrum. Forwards to the exposure the light, for a small, is directed with more water to the eye being used. All cases which are gently removed and long taken to damage as little as possible the patient, especially with. Therefore take that when used light

energy does penetrate. Therefore the position of the larva (or, as the subject is not well suited according to the respective larva used) will have to be suitably increased till the negative rays become transparent. The general effect of the exposure is that, after 2 or 3 days, the larva presents its characteristic due to the incipient effect. After 10 or 12 days the position tells of a further report and later there is a return to a negative exposure of equal time. As an afterthought, no serious action drawing is probably the best. It is recommended by some writers that no drawing should be directly applied but that the skin should be protected by a useful grease cloth. This prevents damage to the growing epithelial cells and binding seems to be either more rapid if this method is used. A pinning of coagulated lymph forms over the growing surface but can be easily removed before the next application of the rays by making the part well so warm sterile water and dabbing the surface gently with cotton wool.

Four and Five weeks—Good results obtained especially if associated with vaccine treatment.

Six and Seven weeks—Good improvement obtained but not definitely cured, depletion by x-rays being required to secure a non-return of the disease.

Lamps—Good results results obtained the greater output of ultra violet radiation from the lamps now used, as compared with the Finson, enables treatment to be greatly shortened and need to be easily reduced. No cases of suppuration, such as used by Finson, are provided with these new lamps, but it is still a matter of controversy whether these act generally, as protection of ultra violet radiation has not been proved to extend greater depths than 2-3 mm., and what deep effects are obtained are by some thought to be due to cumulative effects set up by the reflections.

Effect—Ultra violet radiation causes first a rapid return, as breaking latent. Treatment must be repeated and definite results obtained.

It is noticeable in all conditions treated by ultra violet rays that the resultant scar is less marked and is softer and more pliable than usual.

Duration of War—After the battle of Tientsin, quite a number of cases were received at Chikung with symptoms of the combination leprosy, the treatment of gonorrhea. Many of these had also suffered from tuberculosis in the ear. Using the focused rays, directed on the symptoms through a speculum, remarkably quick healing of the rupture was obtained. The same form of treatment with white matter, however, not with practically little success, owing to the lack of penetration of the rays and also as in other treatments removal of the ulcer for the skin caused much pain, being first necessary before the beneficial effect of the rays could exert their influence.

Chikung—In a small number of cases good results were obtained, healing being hastened. Further trials in this disease are indicated. Major French, B. A. M. C., F.R.C.S., London. Now, reports very favorably on the curative action of ultra-violet radiation.

III.—STATISTICS OF X-RAY WORK DONE DURING THE WAR

The following tables have been compiled which show the work done at the large naval hospitals at Chatham, Dover and Plymouth.—

I.—R.N. Hospital, Chatham.

	Examinations per m.	Soft-R examinations per m.	Diagnosis per 100 examinations	Therapy per 100 per m.
Pre War Average per quarter	25.2	5	—	2
1911 4th quarter	46.6	28	2	34
1912 1st quarter	66.6	12	12	4
2nd "	15.2	27	5	26
3rd "	75.6	28	1.4	24
4th "	28.6	28	5	7
1913 1st quarter	62.1	41	7	36
2nd "	105.1	37	15	32
3rd "	94.2	65	27	4
4th "	115.1	51	11	7
1917 1st quarter	1,072	92.2	41	1
2nd "	1,521	96.6	35	6
3rd "	1,679	104	41	7.1
4th "	1,750	228	64	36
1919 1st quarter	1,711	264	47	76
2nd "	1,675	245	54	36
3rd "	1,664	271	54	7
4th "	1,495	262	44	7
	10,002	2,024	576	187

- Notes: (1) Up to the beginning of 1915 all x-ray work was done in Port Folio Military Hospital.
 (2) Increase in attending patients on beginning of 1917 was associated with introduction of x-ray work which up to that time had been too small for other than radiographic work to be done in a satisfactory manner.
 (3) Greater tendency then of wounded which was small and variable, sometimes none at all, and at larger numbers after the Chatham Barracks was used in 1917 and the attack on Redoubt in 1918.
 (4) Method of treatment—mainly Röntgenium Lanthanum Green Filtered Lanthanum for general work, Green's Lanthanum in eye cases.

II—H. H. Higgins, Ridge.

	Vegetation index	Vegetation abundance	Height of seedlings	Height of parent tree
1000 ft.				
per species	300	10	1	—
(1) 1000 ft.	770	90	—	—
(2) 1000 ft.	611	79	11	—
(1000 ft.)	911	75	10	—
(1000 ft.)	1010	65	8	—
(1000 ft.)	1010	26	10	10
(3) 1000 ft.	10	100	1	1
(1000 ft.)	85	100	11	1
(1000 ft.)	270	101	11	1
(1000 ft.)	625	101	11	1
(4) 1000 ft.	660	100	47	—
(1000 ft.)	661	101	29	—
(1000 ft.)	1000	99	71	1
(1000 ft.)	1000	101	50	—
(5) 1000 ft.	900	100	61	—
(1000 ft.)	711	10	71	1
(1000 ft.)	101	101	10	—
(1000 ft.)	511	101	35	—
	1000	100	60	10

Notes: (1) 1000 ft., same data with 1010. Wounded Polyporus after 1000 ft. of
 canopy dark with 1010. Wounded from Lichens dark with
 1010.

(2) Lichens, redheads. Modified Makhov's (Higgins's) Method, or
 Higgins's (Higgins's) Method.

III—R. H. Hospital, Plymouth

Year Class		Wounded from France	Wounded from Germany	Wounded from Italy	Wounded from Japan
Treatment per quarter		1914	1915	1916	1917
1914	1st quarter	180	50	5	0
1915	1st quarter	142	29	9	1
	2nd "	177	11	2	5
	3rd "	177	15	2	0
	4th "	160	11	5	0
1916	1st quarter	150	19	9	11
	2nd "	170	24	14	7
	3rd "	160	11	14	7
	4th "	157	50	25	6
1917	1st quarter	180	54	7	11
	2nd "	170	1,16	11	10
	3rd "	173	180	28	10
	4th "	150	100	11	11
1918	1st quarter	151	110	11	11
	2nd "	150	110	10	0
	3rd "	153	103	10	0
	4th "	154	100	10	0
		7,714	3,158	400	54

Notes. (1) Wounded Belgians after January, 1914. Wounded from Turkey also 1914.

(2) Landing methods. Bradley's Method see p. 131.

Other Hospitals

R. H. Hospital, Malta.—Here the head of the work from the Gallipoli campaign and also received wounded from the French ships.

Between March 1914 and January, 1918, 320 wounded landwounds were processed. 140 being gavel cases and 90 being military cases.

Landing methods, chiefly by Lewis method and working then on both sides of limb in comparison to right angles to each other. Medicines according to British plan used.

R. H. Back Quarters, Rhinberg.—Work with men after after action with Japanese from 1914 and March to 1918 after landwounds of Turkey in 1916, 1917 after war and on German land in 1917.

First night being before were successfully treated by Bradley's method.

PART II—PRACTICE ETHNOGRAPHICS

1—HISTORY

(a) Numbers, Training and Accommodation

Massillon had been employed on the Navy for sixteen years before it was discontinued. They were treated at Hinder where a few months' course of instruction was held three years; two candidates from the three large ports attending each course. Three eighth numbers were trained each year. At the three large hospitals one man was employed for his whole time, in charge of the massage and electrotherapeutic treatment, under the supervision of the medical officers, having an experience and micrographs.

The remainder were employed, in the number of five in each large hospital in rotation, but in their spare time after they had performed their ward or other duties. This did not tend to produce good results as the men came to their massage work tired after their ordinary day's work. In 1910 an improvement was effected at Hinder when difficulty prevented was obtained to employ as a temporary measure two or three more assistants for their whole time.

At the outbreak of war owing to mischance and consequent removal of active service ratings from the hospitals the position became difficult. At Chatham only one man was retained employed. At Haver one full-time and two or three part-time men were available. Plymouth had one full-time man who also did a day week and four part-time men.

To meet this situation two or three active service ratings were obtained at Hinder by the Medical Officer in charge and given a course of instruction. At Chatham no active service ratings being procurable three local North Devon ratings were trained and served out very satisfactorily. The massage staff was however inadequate and as the number of cases to be treated grew in number, efficient treatment became impossible. No more men could be spared for training and even at Hinder it was decided that in spite of the fact that the demand for treatment remained high some restrictions must be imposed and only such number of cases should be accepted which it was considered could be treated properly the opinion being that it was better to treat a smaller number of cases efficiently than attempt a larger number and only 'sweep' them treatment with, as a result, lack of successful termination of the cases.

This policy was justified by the better results obtained but the ever-increasing demand for massage and electrotherapeutic treatment had to

be met. The great difficulty of obtaining an adequate staff to perform the work required was finally, in 1906, solved by the decision to employ women during holidays. This however took some time to materialize and it was not till the summer of 1917 that the new scheme was in full working order, when the staff at each large hospital consisted of the Head Sister for nursing, the Assistant Sister for nursing, seven temporary reserve nurses and three radiologists.

Confronted with this development came the necessity for increased accommodation. Later grew a confusion of X-ray and Physiotherapy departments were comparatively well situated in their divisions but Chatham had space difficulties. In 1915 approval was obtained for the erection of a new X-ray and Electro-Therapeutical building at Chatham and this was completed in 1920.



FIG. 24.—Electro-therapeutical building, Chatham, 1920.

About the same time came the generous gift of money from the Schweinfurth and Royal School Chatham which was devoted to the equipment of the X-ray and Electro-Therapeutical departments of the three large hospitals. The new building at Chatham was just big enough to hold the new apparatus provided but was rather cramped in space. This was soon remedied by the addition of two small treatment rooms and a clinic room. At Plymouth a ward was given over to the new department. Bisher was

continue in the apartment, a corner of the Sick North Unit 1 room quarters, which permitted these old quarters to be transformed into laundry department quite the best in the three hospitals, and which this year advantage of also having adjacent small rooms available for other purposes, dressing rooms, etc.

With regard to the smaller hospitals they also suffered from too little of adequate nursing staff, but as they did not fill the functions of large hospitals the necessity was not so marked, and cases requiring special treatment were transferred to the large naval hospitals.

The auxiliary hospital at Freetown was very well equipped with electro-medical apparatus being in possession a hydrophobic of good standing. It also had a sufficient staff, having a matron, a civil nurse and two naval nurses.

(B) Improvements Introduced

(a) By Admiralty letter M.D. 3471811 of February 29, 1919 the following points of importance to the nursing department. It included their Lordships' approval of the following scheme.

(1) Supply of apparatus arranged for

(2) The services of the permanent hospital staff by the appointment of an additional medical officer in consultation, duties, the medical officer being for hydrophobic duties being relieved from consultation duties for the purpose of devoting more time to his work as superintendent of the nursing department.

(3) The appointment of two matrons for teaching duties.

(4) The temporary engagement from time to time as required of matrons up to a total of seven for each large hospital.

(5) The construction of selected Sick North ranges.

As regards paragraph 1, there will be (i) a head nursing officer to have complete charge of the nursing and electro-therapeutic department under the supervision of the medical officer who is in control of the whole department. (ii) He is to be directly engaged in teaching the Sick North nursing the use of the mechanical and electro-therapeutic apparatus and instructing in nursing generally, but he is also to be available for such actual nursing duty as may be required. (iii) Also an assistant nursing officer to assist in teaching and to act as a relief to the head nursing officer in case of sickness or leave and to work on others or selected patients.

As regards paragraph 5. It is intended that the way to build up a highly trained nursing staff of matrons. This will gradually die away with the provision under paragraph 4, and eventually a full time working staff of seven Sick North nursing matrons will be allowed for each large hospital.

Four selected Sick North nursing are to be detailed half-yearly for a full term course of instruction at each hospital. At the end of the course they will be required to pass a satisfactory examination. When they will

be granted an allowance of \$100 per day and his per diem (as addressed to) when working on Hospital Transportation Hospital Bldg., E.N. Harwick Veterinary School, 1414 N. University and Cumberland for four weeks. Day Hospital 141 and 141 1/2 rooms. House Clinic, Medicalman Clinic, 1416 Central Hospital and E. 141 1/2 at the Webster, and E.N. Hospital, 141 and Webster and Charlestown.

The medical officer at Chatham Hospital employed in message department will be required to do up a syllabus of the course of instruction, for a collaboration with the medical officer from the other two hospitals.

(5) In July 1937, a Conference was held at Hader between the Medical Officer in charge Message Department at Chatham (President) Hader and Plymouth and the head message bureau from the same hospital. The following are notes from the Report of the Conference as forwarded to the Admiralty:—

(a) Course of instruction to commence on January 1 and July 1.
(b) Hours of instruction: twenty-eight per week. The study hours two hours daily. (i) Leave: each end, leave Saturday till Monday morning.
(c) Detailed syllabus (not given till later). (d) Examination.
(e) Standard—That of I.S.T.M. (Incorporated Society of Trained Messengers).

(f) Place—At Hader.

(g) Fees—(i) Written, held simultaneously, at Chatham, Hader and Plymouth a week before. (ii) 100% rate of Hader. (iii) Messengers. (iv) Practical. Half the time for general message and half for special message. (v) Messengers.

(7) Messengers—Incorporated messengers for I.S.T.M. (8) Successful candidates to be employed at once for a further six months, during which time to receive instruction in practical applications of electrical equipment in addition to lectures on the Theory of Electricity. (9) To be examined at end of second six months on Medical Electricity. (10) Instruction must to be provided with separate list up date, for each student. (11) Reference Library to be supplied for the class.

The general effect of the scheme was that the future naval messengers would be as highly trained as any outside the service and that at the end of six weeks, he would possess certificates that would ensure him ready employment in civil life.

B—EQUIPMENT

List of apparatus presented to the E.N. Hospital at Chatham, Hader and Plymouth, provided by the Johannsmann and Earl School Chatham & Fund.

Message Tables
High, Plain
L. & Plain
Poly Tables (one, Dark Colours)

Medical Room
Surgical Conference, Hader and
Surgical apparatus with sliding case
attachment.

Metamorph. Rapid and adjustable	Parade (not (Himms))
palate	(Himms) with automatic
Smaller Foot Ocean bottom Appa star	with a very special
Foot Mechanism and Mechanism	(Gordon Jones)
Apparatus	Londoner-Willing Pass (Gordon Jones)
Light Pattern and Extension	or (Gordon Jones) Apparatus of
Apparatus	Thermostatic Apparatus (Himms)
Shoulder cooling Apparatus	High frequency Apparatus, (Gordon Jones)
(Himms)	Below Foot and Side Sides
Other Pattern and Extension	Parade
Apparatus with shoulder in	Stomachal Motor generators
bottom	Stomachal Interceptors
Prism, Wind, Electric Apparatus and	Stomachal Interceptors (Gordon Jones)
apparatus	Voluntary (Gordon Jones)
With Red Machine Mechanism	Not an (Gordon Jones)
and extension	Below other Parts
Upper Extension (weight and policy)	Below (Gordon Jones) (Gordon Jones)
(Gordon Jones)	Upper (Gordon Jones) Apparatus (Gordon Jones)
Prismal Prismal Prismal	Stomachal Apparatus (Gordon Jones)
With (Gordon Jones)	Below (Gordon Jones) (Gordon Jones)
	Below (Gordon Jones) (Gordon Jones)



Fig. 1. (Gordon Jones) (Gordon Jones)

III—TREATMENT

(1) Heat

In a treatment for neurage, especially in cases of sustained pain, heat has a marked effect, i. e., the application of heat causes forms of great advantage. The effect is the dilation of the surface capillaries, directing the circulation into deeper parts. This is accompanied by a constriction of the superficial and dilation of the deeper vessels, so that the flow of blood into deeper is stimulated. Heat may be applied either by radiant heat, hot dry steam, hot baths or liniments.

(a) *Local Heat*.—This may be applied by a simple dry lamp suspended in a conical reflector which is moved about over the surface to be treated at a distance of a few inches till the surface is reddened. More commonly used is the local radiant heat bulb in which an incandescent 100-watt lamp is mounted in a frame suitably adapted to angles. In this method a temperature of about 160° F. can be maintained for any length of time and usually 15 min. is very ample, unless to obtain the result desired. These heat bulbs should be light and portable. A convenient form is illustrated (fig. 35).

A general heat bulb method used to obtain profound depletion in conditions such as venous thrombosis is generally arranged in a full bed so that the whole body is exposed to the heating effect with the exception of the head. The temperature is raised to about 150° F. before the patient is placed on it. By means of a regulating rheostat the current is decreased till a temperature of 160° F. to 160° F. is attained. This may be kept up for thirty to forty minutes a cold compress being applied to the head and preparations encouraged by fanning water. The pulse should be watched and, if it rises above 160° F. or there are any signs of burning, the treatment should be stopped. After the treatment the patient should be sponged down with warm water, dried and put to rest between blankets for half an hour.

The compresses—A useful way of applying these is to place a pad wrung out of cold water on the part to be treated. A local heat bulb is then placed over it and the compress has its temperature raised till the desired amount is reached at that or long as desired.

(b) *Hyperthermy*.—The simplest form of local treatment is to immerse the limb in water at a temperature of 100° F. to 105° F. and allow it to soak in it for fifteen minutes, when the limb may be massaged under the water.

An improvement on the above is sometimes of use in cases in which the water is kept in fairly vigorous circulation by means of regulating taps and an overflow. The movement of the water appears to exert a stimulating action on the skin and the heating effect is increased. The enclosed bulb is a further elaboration of this method. The water is heated to

circulate by means of a turbine at the bottom of the bath, and compressed air is introduced so that the bath is maintained in a swirling, bubbling current. The most generally useful forms are those for an arm or a leg, but a larger type is made into which it is possible to immerse the whole body.

At Haver there is no installation of baths run by compressed air only. Great benefit is obtained from those in which pumps pumped out water impure to correct, and any condition in which the circulation and nutrition is favored. (Description will be described later in Electrical Section.)

(3) Massage

Massage will prove its value during the war and will be needed for long afterwards to help to restore their function to the crippled limbs. No special description of technique is necessary (the general term) principles governing the work.

One word of caution. It was found that great care had to be taken in composed comminuted fractures in which sepsis had occurred. It is of infection often lay dormant for considerable periods before finally being caught. This requires treatment was apt to light up these infections.

In convalescence, the use of general massage in the early or non-painful of the treatment was found to be of great value. In all cases it is advisable that in general massage the operator should be of the same sex as the patient. In convalescence this is of special importance. (Hospital, Longwood, Longwood, Boston, Massachusetts, K. N. Hospital, Chelsea, and of the opinion that the reports of convalescence have been good. (The patient is more comfortable and easily available work has not on the whole view of general massage great care had to be taken to avoid as far as possible any stimulation in that direction. For that reason after the introduction of the female staff, it was found necessary to retain male operators who were capable of the this purpose particularly entirely.

(3) Electro-Therapeutics

Formulated with massage electric treatment finds its place. Briefly, speaking its effects are: (a) Thermal (b) muscular (c) nerve-muscle or stimulation of muscle function.

(a) Thermal. Effects—Induce then first heating action—

Builds up—The current supply of a, essentially high-frequency oscillations which are continuous and not interrupted as in the ordinary so-called high frequency current, also they are of comparatively lower voltage. In both, the therapeutic action on the tissues is the same—the production of heat in them—but in this way the effect is much more marked.

Working from an alternating source the voltage is raised to about 2000 volts on the secondary winding by a choke transformer. By the current resistance of large capacity are changed. These discharge them.

surface of the metal electrode is polished with a fine, smooth, 100-grit metal dust and copper dust and is then very closely inspected for any defects and not merely for smoothness. It is also necessary to determine during high frequency treatment all directions for putting the electrode into a machine in order to obtain the desired treatment which depends on the patient.

The apparatus is controlled by means of a variable switch, by means of which the frequency can be varied from 100,000 cycles per second up to 1,000,000 cycles per second. The frequency can be varied from 100,000 cycles per second up to 1,000,000 cycles per second.

The spark gaps require attention. It is necessary to have the spark gaps in the best condition, because cracked or worn spark gaps will not give the best results. Another point is that the spark gaps must be kept in the best condition. Another point is that the spark gaps must be kept in the best condition. Another point is that the spark gaps must be kept in the best condition.

Application to the Patient.—If the current is to be applied to the area, the metal electrodes may be placed by the patient or the metal electrodes may be placed by the patient or the metal electrodes may be placed by the patient. The important point is that the current must be kept at all times at an even rate or produced regularly, sparks pass and cause painful lesions. In place of bare metal electrodes being applied to the skin, cloth covered or wire covered (10 per cent) may be interposed.

It is probably best to use these pads as with them only one perfect operation is obtained over various electrodes, such as for instance the shoulder joint. The amount of current that can be tolerated is, the patient varies directly as the square of the surface area of the pad or electrode. The following are the limits of the electrodes generally used and the strength of the current which may with ease be used with them.

Size of electrode in inches	Current strength in mill amperes
Anteroposterior Electrode —	
2 inches by 2 inches	1000 to 2,000
2 " 2	500 " 1,000
2 1/2 " 2 1/2	500
Circular Electrode —	
1 1/2 inches diameter	500 to 1,000
1 1/2	500
1 inch	500

The dosage noted above only applies when the current is transmitted unimpeded through the body or across a limb. When the current is applied longitudinally through a limb as, for instance, from foot to hip or from hand to hand, the dosage is limited by the cross-section of the limb at the two ends and the point in the middle. In these narrow parts the current and the heat are most concentrated, and the area of the pad is not taken into consideration. The dosage through the wrist must not exceed

500 milliamperes just through the soft tissue, not inside 700 milliamperes.

[The current generator is designed on the principle of the "Wien Bridge" used in the U. S. Naval Medical Department, used by the War Office, etc.]

The adjustment of the current is adjusted by the patient in about 600 volts and current up to that it is not even felt. However, it is difficult to try short volts for the amount of current to be applied and one should be guided chiefly by the patient's sensations and it is best to adjust the current to slightly less than he says he can bear comfortably. If there is a deep ache in the limb the current should be reduced at once. There are a fairly frequency of spontaneous pains in applying the electrodes and sometimes they may not appear for some hours after treatment, these are due to the nerve in the skin only.

Good results have been obtained in some cases during nerve regeneration, sensory and motor. In these cases the electrodes are best applied so that the current crosses the nerve longitudinally. As a rule, longitudinal currents are applied for two to seven minutes but in many cases smaller currents continued for a longer time are preferable.

In the case of joint ankyrosis the electrodes are best applied laterally, so that the current passes transversely and it is a good practice to use the cross bar method that is first to apply the pads laterally and then cross posteriorly. In these transverse applications the treatment should be continued from fifteen to thirty minutes.

Diathermy has been very successful in the treatment of gonorrheal arthritis. The temperature of the joint is raised throughout and the gonorrhea appears to succumb if the temperature of its surroundings is raised a few degrees above 90° F. Diathermy has not yet been employed surgically in the knee.

Electro-Procurement. Currents produce their effects also by the development of heat within the treated organs but there is nothing unique in not comparing to diathermy, which is now employing high-frequency apparatus for that purpose. The etheric layer and *degl. frequency* effects produce their effects in a different way. Their stimulating effect is produced on the skin. The stimulation is due most probably to the heating of minute points in the skin and, as a physiological result of peripheral stimulation of the sensory nerves, there is a reflex rise of blood pressure. This effect can be seen in the case of low blood pressure headaches.

Again, the passage of ions discharges through the air causes the formation of ozone and various acid vapor acids. It is probable that these chemical products play a part in some of their germicidal action particularly in the treatment of some skin affections and infected ulcers.

Myo-Electricity.—The passage of a constant current through the body has when it is called a "relaxing" action and has the power to abolish the feeling of fatigue from a heavily worked muscle. The current probably causes the re-arrangement of ions along the path of the current through

the tissue. The quantity of ions removes the patient's cutaneous impurities, soft, firm and makes into the H. stream of hydrogen. The ions migrate in water in some cases although in the treatment of non-water bearing tissues, but a most clearly noted improvement. This has a large field of application and has been very successfully used in several hospitals.



FIG. 1.—Continued Fig. 1 of Apparatus.

A portable high frequency apparatus, was installed in the apparatus provided in the following, and I will describe it.

(a) The current from a sufficient amount of strength from 50 to 100 volts, drawn from a battery, runs from the main through a short resistance, or from a variable resistance under operation. This has not to be produced and removed, all classes of shock to the patient through an electrical cord.

(b) The electrodes may be made of sheet brass or aluminum, but what has been found most useful is for the upper part which can be easily bent to adapt it to any treatment in nature. The electrodes are connected by leading wires to the combined conducting cables from the source of supply of the current.

Interposed between the electrode and the skin is the electrode pad (but in traveling equal to electrodes in various layers of skin). The pad should be larger than the electrode and is soaked in the solution. Assuming the same 1 cc. area, be taken that the pad correctly and evenly applied. Any change in tissue concentration of the current to that upon which the spinal fluid layer may be caused. The larger the pad, the more current can be passed with consequent greater therapeutic effect.

(4) The solutions used are generally 1 to 2 per cent. Stock solutions of 10 per cent. strength may be kept and diluted with ten times their bulk of normal tap water.

(5) The ions used.

Tissues with Negative Current (Anode)		
Chlorine	produced from	mercurous salt
Iodine	"	mercurous iodide
Sulphuric	"	mercurous sulphate
Tissues with Positive Current (Cathode)		
Iron	produced from	iron sulphate
Hydrogen	"	mercurous sulphate
Sodium	"	mercurous chloride
Copper	"	mercurous chloride
Mercury	"	mercurous chloride
Uranium	"	mercurous chloride
Carbon	"	mercurous chloride

(6) The skin should be freed from grease by washing with soap and water or by solvent. Any skin lesion may be protected by waterproof tissue or by a layer of vasoline. The pad must be well washed in the solution but must not dry. Pad and electrode are inserted in position by a fine bandage. This is the 'active' electrode and if an anode is being used it is connected with the negative pole of the supply, if a cathode then with the positive pole.

The 'indefinite' electrode (to complete the circuit) should be smaller in arrangement but rather larger in size. As a rule its position is immaterial, but if deep effects are desired, e.g. in contracture, it should be placed on the opposite side of the limb.

The current should be started from zero and slowly increased until, after the treatment, slowly returned upon to zero. The maximum value of the current should not exceed 1 to 2 milliamperes per square centimetre (i.e. 10/15 per square inch).

CONTRAINDICATIONS IN INDICATION IN NERVE DISORDERS

Activity—(a) Inflamed parts. The chlorine ion increases its electrolytic action. The active (negative) electrode should be large and be washed around the point, the indifferent electrode being applied, e.g. to the opposite limb.

(3) Current 20 to 30 amperes is applied for ten minutes and later increased to 40 to 50 amperes for 15 to twenty minutes.

(4) Further relief will not at this stage be obtained by immersion with cathodic ions. Using a very large electrode, enveloping the joint and the back above and below, as much as 100 am. the electric current perhaps good results. In the late stages the electric ion should be used as described above.

(5) Gony cathode. Lithium ions attached at the positive pole and cathode at the negative do good. They may be applied either by bath or by the ordinary pole.

Cervical Ulcer.—The ulcer should be first removed. A special eye cup-shaped electrode can be purchased. This is filled with 5 per cent. zinc sulphate solution and applied to the eye in the ordinary way as in giving an eye bath. A current of 1 am. for five minutes or longer if the ulcer be large—no cathode.

Felicitate.—In the same acute stage may be relieved by cathode immersion, about 40 am. for twenty minutes, giving marked relief. When there is much thickening or scabiness on posterior surface of the ulcer, more benefit.

Gonorrhea.—In acute gonorrhea treated at Chatham. The method is as follows: A platinum silver or rubber cathode, in which are numerous perforations is passed into the urethra as far as the meatus urinarius. It is fitted with a rubber collar which just enters the meatus, and a slight rod of platinum forms the positive electrode. The negative electrode consists of a porous pad saturated with sodium sulphate. A solution of sodium sulphate (2 per cent.), containing 45 per cent. sodium chloride as it is injected into the catheter and is prevented from flowing away by the rubber collar. A current of 1.5 am. is passed for ten minutes and is then reversed, the catheter meanwhile being filled as required by means of a syringe. The object of reversing the current is to distribute the desloughing effect on the mucous membrane caused by the sodium ions which are repelled from the positive pole. On withdrawing the catheter, masses of mucus are found emerging from the small orifices. These masses are not to be dried completely. They passed after the treatment under many further administrations of potassium and manganate. The treatment is repeated daily until the discharge is slight and then on alternate days.

An accurate catheterometer meter is essential, as if greater currents are employed damage may be done to the mucous membrane.

Gonitis.—When there are tender spots on the top of the scrotum indicating localities in the nerve sheath, saline or cathode ions should be used. Tissues of saline is passed over the tender areas, and a pad soaked in solution of sodium sulphate is placed so as to cover them. After the current has passed for a few minutes the heavy stain on the skin will disappear. The current should be passed for fifteen or twenty minutes. The treatment can be repeated daily provided that the symptoms

positive pole, indicated. In many cases, spaces 1 or 2 cm. round anorectum were exposed as cathodic zone.

In incision, the nerve was compressed deeply, the probe should be long and large (1 cm. wide, and from backbone to knee) and the cathodic electrode applied to the front of the thigh. After the treatment should last long as much as possible.

Incision may be alternated with cauterization with electrolytic cauterizer.

Notes.—Case one, produced excellent results in most places, including, the most chronic, and resistant forms. The skin should be cleaned and dried completely. All ulcers or irregularities should be filled with zinc powder. Cotton wool saturated with the solution and over them the fine gauz applied care being taken that a smooth surface between them is obtained.

If the skin can take a solution of sodium or potassium iodide (1 per cent) it really was essential. When the skin can not stand, the zinc and edges of the ulcer take on a white appearance, treatment should not be repeated till this disappears.

As regards the treatment of these, it is essential that the same, such as dead tissue, ulcerated surface, etc., should be removed. After that has been done, cauterization will greatly hasten their closing up. It is not easy to secure contact between the electrode and every part of the wall of the ulcer. A rod of fine metal chosen (the copper, etc.), with a layer of cotton wool wound round it and soaked in a 1 per cent solution of the salt of the metal, is inserted into the wound down to its end. The amount of current used is a mile or more, conforming to the general rule not to exceed 2 to 5 milliamperes per square centimetre.

If the ulcer is very small making it impossible to introduce the wool covered metal rod, then it may be lightly plugged with gauze soaked in the solution. The projecting end of the strip of gauze should then be threaded through a small hole in a piece of waterproofed or the skin and then connected with the conducting cable. This gives us the metal of the cable coming in contact with the skin.

On Case.—Garrison, Lieutenant-Commander S. Forebury (Physiotherapist) reports marked success in treating this condition by compression with zinc iodide which proved to be the best drug. The method was as follows:

The external incision was filled with the solution (2 per cent) and a cone-shaped wick saturated with solution was applied to the incision and over this a pad with absorbent was applied. Occasionally the solution leaked through the Foraminous tube, but there was sufficient left in the wick which was inserted in the incision. The negative pole was used first commencing with a current of five milliamperes, and working up to the patient could stand. After fifteen to twenty minutes the current was reversed, and this was given for another twenty to ten minutes. The two electrodes matched were carefully and, in cases in which no improvement was noticeable after about five administrations, treatment was stopped.

better. After this progress is rapid and by the fourth day it usually has the skin and feet appearance of a rapidly healing ulcer.

The prognosis, as a rule, is not making in one who has not been ulcerated before. It is not uncommon, it may be due to the fact that there is a marked selection (the organism of salt runs slowly) and a change to the soluble as copper ion is introduced if it is thought that organisms may be present. The mercury ion certainly kills the *S. pallida*, but the organisms of *Chromium* are more resistant.

There is unfortunately, no probability of absorbing syphilis by mere medication alone, but it is possible to heal the chancre more rapidly than by ordinary drainage, and in this way the patient may be fit for discharge by the time the constant number of intravenous injections have been given—instead of having to wait for the skin to heal. In two cases of very early cases, treated by me at B-N Hospital, Plymouth, some years ago and healed in four and six days respectively, the Wassermann reaction became positive afterwards, though no secondary symptoms developed. In the meantime the usual intravenous injections had been given.

But the extremely rapid healing of a sore following the application of mercury ion may be of considerable diagnostic help in cases in which the *S. pallida* has not been found, because, in doubtful cases, if the sore heals very rapidly after the application of mercury ion, it is almost certainly syphilitic, and it may then, with water experience, be possible to begin intravenous treatment without waiting for a positive Wassermann.

Germicide.—This solution can be applied liberally whether the patient be broken down or not. If the skin be broken and the patient keeps a constant of 20 to 30 centimilligrams ions be applied for twenty to thirty minutes without injury. The foot may be folded in cotton bandages and attached to the negative pole, a 2 per cent solution of potassium iodide being used before painted on and driven in by the negative pole to the extent of an inch or two but it must be held in place by some small force. *Germicide* of the camp ion should not be treated by this method. The effect of the solution can be very rapid as broken down patients after a few applications. It may be followed by the same ion either in conjunction with it or by itself.

Chromium.—These are very resistant to treatment, and certain cases will prove disappointing in spite of the silver ion. There is no definite specific as there is for the syphilitic ion.

It is necessary to vary the ion for different cases and also frequency during the treatment of a single case. As a rule it is good practice to change over one or two applications of chromium ion, i.e., 2 per cent solution of sodium chloride attached to the negative pole and applied as carefully as described for syphilitic case. The last ion is not after the chromium ion, as, in my experience, copper—2 per cent solution of copper sulphate applied at the positive pole. If the case is possible, a current of two milliamperes may be applied for five minutes to begin. This may be increased to eight minutes at later applications, but care should be taken not to produce a

though. If possible, a current, one or two applications of chlorine ions every five days will clean the sore again and restore a healthy appearance. The copper may then be recommended and the hot material is about every third or fourth day. Another metal ion is not used in the solution on epidermis while it is not applied by the negative electrode. At later stages the sore can be a skin of one. But in all cases of soft sores, the operator may be prepared for disappointment and it will frequently be found that a sore which at first began to heal well becomes active at one stage and suddenly needs treatment. In such cases one should change the ion frequently and by constant personal attention see that there is good application of the solution to the part. There is no doubt that better results are obtained if the medical effect can apply the treatment himself and so make where the sore is very irregular or deep it is best to give separate applications to different parts of the sore, to make sure that no part is left untreated.

There is one condition in these disappearing sores that some medical men give results which are probably better than those obtained by any other treatment. In some of these cases of soft sores, I have used other metal ions in conjunction with the treatment with good results.

Skin's Surface—When large sores are left following an operation for the removal of phlebs, very good results follow some treatments—first with chlorine ions to clean up, and later with zinc ions. If the hole has taken on the character of a channel, as sometimes occurs it must then be treated with copper as described above, but very thorough cleaning should first be done with the chlorine ion.

In all cases the strength of current may be that which the patient can bear comfortably. The ions should be varied according to the current form. In most cases a current of one or two milliamperes per square centimeter is better without pain. The dose should not act as a rule be increased after finding it well established as to the most out of toleration by an overdose. It should rather be reduced.

When the hole cavity is large it must be packed very carefully with all its crevices with cotton-wool soaked in the solution. The current is then led on by a suitably shaped rod or sheet of metal. Care should be taken to see that as far as possible the electrode is equivalent for the various parts of the cavity so that the edges may not get too much.

It is possible sometimes to fill the cavity with the solution and insert the electrode into the liquid. There is, however, not much advantage in this method and it is very troublesome. It is also probable that most of the current may go to along the surface of the liquid, and it is probably best in the case of irregularly shaped cavities, to make two or more applications to different parts to ensure that no corner is neglected.

(5) *Marfan's Disease and Erysipelatous or Myoma Flaccida*—The war produced a very large number of nerve injuries with conditions resembling Marfan's, and the diagnosis and prognosis of these conditions was a very important feature of the work of the electro-therapeutic department.

1950). When the standard using a gas-purged, dry nitrogen medium was introduced by the time the Condenser Test Unit and the Condenser Testing Apparatus had completely been supplied with the apparatus or with modifications of it.

The older method of testing by fusible and galvanic currents had several defects. Fusible current is not so precise, measurable, and galvanic current, though measurable as to strength, is not concerned as to duration of flow, which is always too long.



The Model 100 Condenser Test Unit.

4. *High-rate discharges* on the other hand have a definite value and indicate as to τ , depending on the capacity of the condenser and the maximum discharge current. The latter, the resistance of the body, is difficult to ascertain for short impulses.

Testing pattern consists of two or eleven condensers varying in capacity between 0.01 microfarad, giving an impulse lasting 0.1×10^{-6} of a second, and 1.0 microfarad, giving an impulse $1/10$ of a second. Modules are tested by these condensers successively, beginning with the smallest. Normal modules are allowed to respond to discharges from condensers of capacity from 0.01 to 0.05 microfarads; modules with partial R.D. require condensers of larger

The older methods of testing used an special machine except to see that "polar reversal" (i. e., ACC > ROR) was not tested for except in doubtful cases, as this phenomenon is not a constant feature in R.R. and is therefore no longer thought an essential for diagnosis. In combination with the electrical machine, testing the patellaris, and perhaps similarly should never be omitted. The strict instructions passed as to the condition of the sensory nerves is very close of the utmost value in prognosis and, in coming to a decision as to whether operation should be performed or not, the most delicate and responsible part of the work of the electro-therapist.



Fig. 10. "Kaiser" Electric Apparatus machine, with an "acid" potentiometer (see text) and light meter. (See "Kaiser" Apparatus Catalogue, with instructions, P. H. Cat., photo. obtained by "Kaiser" apparatus.)

The course of one of the things brought into prominence during the war, and which has thoroughly proved its value, is the importance of rhythm and ordered distribution of work, as a means to the more or more of reduction of its tension. The aim is to stimulate as much as possible the nervous system, and to provide, at least periods of rest, in which the waste products of muscular contraction can be removed. Thus undue fatigue, such as arises in the prolonged stimulation of the muscles by local current, is avoided. Mr. W. Stanley Brewster's method has been extensively used in the naval hospitals with the most satisfactory, and in

same rates, satisfactory results. The function and is of special importance. It is capable of easy control. The strength of the current can be varied by using either one or two of the dry cells supplying the current, also by using one, two or three of the windings of the secondary coil. Also the rate of rotation is made to slide easily across the primary battery. The sliding of the rate on and off decreases the content of the current as the rate is withdrawn and increases it as it is derived. The winding of the secondary coil is comparatively short and thick producing a current of low high tension than has formerly been the custom, and which produces a muscular contraction which is practically painless.

The mode of use is simple and easy. The limb to be treated should be placed in a position of complete muscular relaxation, slightly flexed by means of a sand bag. The large indifferent electrode is either placed over the motor trunk at some convenient convenient area, such as the buttocks or chest. The active electrode is a metal disc about one inch in diameter covered with lint. It is placed over the motor point of the muscle and is grasped, together with the muscle, between the thumb and the forefinger of the left hand while the right hand rhythmically moves and withdraws the wire in the coil. The grasp of the muscle by the left hand is important, as by it the amount of contraction is easily gauged. Great care must be taken not to produce exhaustion as muscles recover slowly and may be badly damaged by over-stimulation. Fatigue felt by weak irregular contractions, is a signal to stop. The wire is inserted and withdrawn rhythmically by the right hand at the rate of about twenty times in the minute. This movement can be performed by mechanical means such as a small motor operating a crank but this is never so satisfactory, as when it is performed by hand, the more delicate control not being possible.

Another form of rhythmic interruption used was Lewis Jones' patient. In this, a metal rod is mechanically dipped into a cup of water and then withdrawn. The passage of current varies with the depth of immersion of the rod in the water, thus, as in the Barton coil, the current rises slowly from zero to maximum and again falls slowly to zero. This slow rise and fall is found to be the most productive of good results.

The continuous interrupter on the other hand produces rhythmic contractions but the rise and fall of current is more abrupt.

The Lewis Jones interrupter was chiefly used by us in applying the muscular current. The form of current is useful in maintaining muscle function, and was more generally used in cases of general weakness of limbs.

When complete R.D. is present and no response can be obtained from faradic impulses, then the interrupted galvanic current is used and for this the metronome interrupter was found useful. Here again, the danger of over-stimulation and fatigue must be avoided, and, especially in the early stages, it is best to give short treatments and to watch carefully for signs of fatigue.

When small quantities of the purified sugar to standard solutions, then again the same amount was heated through it is commonly stated that it disappears immediately from the mixture before it is completely liquefied. The same amount of solution of calcium hydroxide may be used with the same amount. This can usually be explained by all of the various forms of products resulting from the various heating of the sugar from the mixture through which it is heated.



Fig. 1. Sugar in a flask.

(4) Sugar in a flask by Aggregating Solids

Sugar has for a long time been used as a source of particles in the air to prevent the deflection produced by the action of the heating on the air, as opposed to the particles in the air.

If it is assumed by most means, the paralytic muscle can be trained and stimulated by the knowledge which in this is the strength and local information are produced which only special equipment.

But splints can carry out a greater function—that of keeping the muscle in a position of physiological rest without which recovery is function is considered more difficult. For muscle the position of physiological rest is one of complete relaxation in the sense that there must be no dragging on or stretching by its opponent, and the opponent must therefore be elongated and relaxed beyond the state normally expected as necessary to produce a condition of equilibrium with its opponent.

The use of "suck up" splints in most deep and of special kinds for feet deep are well established as before, but the majority of people, with the exception of the latter.

William John Macdonald, I.R.C.S., F.R.S.E., has worked out the position of rest for all groups of muscles and they may be applied to the foot. The Action of Muscles, and his own splints (splint line) have great valuable work in paralytic of the defined and other muscles. (The upper extremity).

All paralytic muscles should be treated from the point of view of the efficiency of the position of rest. It is a fact that muscles beyond the position do not waste and are therefore in a far better position to meet re-education when function is being restored.

Most valuable assistance to the nursing departments (and the use was given by the hospital and other accepted supply dep. in. These voluntary organizations supplied many of these special splints to us, and we are thus a great debt of gratitude for supplementing and filling in the gaps in our service, should.

(5) Machine Therapy

This term has been applied to the use of special apparatus for exercising, stretching and weakened muscles and joints, and increasing their function. Before the war, most hospitals had no equipment of this kind.

Early in 1915 Thompson, Surgeon General, St. George's Hospital, London, had to Charles Hospital his young machine, large exercise and weight and pulley apparatus, and through the influence these apparatus in the hospital type were supplied.

In 1917 with money from the Johannsmann and Karl Schmid Children's Fund, further apparatus was obtained and these and Plymouth Hospitals had similar equipment installed. The following are the various apparatus —

It is seen that pulley machines are placed in three positions providing downward, horizontal and upward pulls. These pulleys of operate in the same set of weights. These weights by a simple locking device can be separated from or attached to each other, or then any desired number



FIG. 10



FIG. 11

the handle, thus varying the amount of resistance in the way of propulsion.

For *purpose of exercise*, *Weight and Pulley Apparatus*, with *sliding seat* (Fig. 10).

By means of this apparatus practically every muscle and joint in the body can be exercised, all that is required being to direct the position of the body and choose the appropriate pulley handle.



FIG. 10.—*Weight and Pulley*. The sliding seat (marked with number 1) is attached to the handle (2). The handle is connected to the sliding seat by a rope (3). The sliding seat is attached to the pulley (4).

The sliding seat attachment which can be folded up out of the way is a very useful addition. The steepness of the slope of the slide can be altered to suit each case. The sliding seat can be used with or without the pulley. The weight of the body on the sliding seat can be used as the

entirely upon immobilizing the hip, knee and ankle joints, by simply allowing the arms to slide downward, recovery being obtained by action of the quadriceps.

(15) *Upper Limbs*. — This is useful for recovering hip, knee and ankle. The patient occupies the supine position, so that while the sound limb may follow the movement set up of the trunk, the disabled limb can at the same time be started with a minimum action of motion, which can be increased as recovery takes place. Work against resistance can be started by means of an adjustable hand brake.



FIG. 22. — *Position of Limbs and Line of the Apparatus*

(16) *For the Feet, Thighs and Extremities Below*. — The principle of all the *Under-legs of apparatus* is the raising of a weight by a lever. The weight can be slung on the lower of any point in the length, the lengthening of the lever shortening the force necessary to raise it. They can, thus be employed for passive movements the weight on the lever acting as a pendulum, which can be started swinging by the patient himself or by an attendant. Further by altering the position of the lever, the direction of resistance can be changed so that either the flexion or extension of joint can be increased.

1. *Generalized Post Correspondence Problem*. Given a pair of proper permutations π and σ of the same set consisting of n symbols, is there a pair of strings x and y such that $\pi(x) = \sigma(y)$? The two permutations should satisfy a certain set of conditions, depending on the problem. For a particular correspondence problem one is given a stream, the permutation is computed on the symbols in the stream.



For the purpose of this study, the following hypotheses were formulated:

(a) *Spontaneous Effects and Unknown Mechanisms*. The pattern in (1) is, then, as well, a pattern in which the frequency of the effect is proportional to the dose. The logic is that, owing to the stochastic nature of the process, a given dose produces a certain number of effects, and it is on average proportional to the dose. The value of the dose is not a measurement of the point. The period of action of the agent, in this case, can then be set to zero and also controlled by the pattern (1), and the pattern of action can be gradually increased (the other movements of the pattern of the dose is defined so that, with a change of the dose, one of the movements can be observed).

for Point 1 of EPPs. However, (predicted by) Spencer, Hyman and George) = This is an old thing, usage changed long, or they take a local id.

The shape shown may be easily grasped by the hand, and it is useful in the early stages of the treatment of contractures of the fingers, increasing the flexion of the finger. The device may also be used as a slight resistance to the finger. The leg should be held in position but not drawn at such a pressure.



FIG. 100.—Leg and Foot Extension Exercise Apparatus.

(2) *Bright and Peck Finger Machine*.—This is also an instrument for the flexion of the fingers. The machine has, in addition to the passaged, ratchet or fixed phalanges according as to whether it is desired to exercise the laminae, the flexor volens or the flexor profundus, respectively. The resistance is varied by the number of weights employed.

(3) *West Flexion and Extension Machine*.—This has no action controlled by a rheostat. The roller is made in three stages of thickness to allow of it being grasped by hands of varying capacity of finger flexion.

Openness, that is, to the best position for the ruler, every performing is kept as horizontal as the level of the elbow joint when the patient is standing. If the ruler is then grasped overhead, the forearm is fully pronated. Personally, I prefer that the ruler be vertical, the forearm being then half way between pronation and supination, in which position the forearm and extension have greater freedom of vision. In this case, marks are required to place the patient at the right level for his appropriate grip.



Fig. 10. The patient's hand above the horizontal position.

Fig. 11. The *Prone* and *Supination* positions. The ruler is held vertically by a track in a stand. The patient takes the maximum grip on the handle on the level near the elbow joint. The designated hand is moved behind it.

the two limbs being measured at 100 cm. the arm that is to be extended. Thus, a small, weak, arm, and so, all variety of positions and expansion.

(10) *Positioning and Extension Machine*—This has the upper handle above, and lower, below, and is suitable either for the random passage of writing or for the direct and extension. The arm runs on rails to either side of the track and the roller arm can be adjusted to the proper position. This roller can be moved and locked ready to allow the roller to be placed accurately on the rest at the greatest point of the lever. The hand grips the handle, which can be easily adjusted to the length of the forearm.



Fig. 10. *Positioning and Extension Machine*—The roller arm.

For passive movements the lever is set at an angle corresponding to the centre of the volume of writing action of the elbow and the pendulum action caused by the attendant. For active movements the lever is arranged so as to exercise either flexion or extension. By lowering the rest and moving to one side or the other the elbow rest, the shoulder joint

and the springing point of the pedal (see Fig. 1) and grip member (uncompressed) (double the joint was loosened) (see this and Fig. 2) were identical.

With the *Springing Point* (also *locking Member*) — the *flexibility* (up) (and down) member was not a spring, a spring full relaxation of the arm, at the shoulder, the point of the arm, or shoulder, being in spring without strain.



FIG. 1. *Springing Point* — *locking Member*, with full relaxation (flex) at the joint (flexion) (up) (down).

It was with the arm fixed close to the side and incapable of abduction it was obvious that some improved form would have to be devised. Messrs. Spencer, Smith and George, the makers, fell in with our ideas and the present type was evolved. This allows of arm working being performed as desired at any angle from adduction to full abduction also the working movement itself can be varied from the smallest circle to the fullest circumference of which the joint is capable.

The next is raised as far as is that the width for a normal body is the width over the parasternal point. The width on the normal side is added to the other (degenerate) breast. The arm is passively, for the body so that movement can occur only in the shoulder joint. The hand grips the sliding hand grip. This has to be made so that up and down the motion can, as it is impossible to make the parasternal point of the machine to correspond exactly with the center of the shoulder joint. Movements should commence with the arm close to the side or only very slightly abducted. In



FIG. 11. Exercise of the shoulder-joint, 1910-1911.

which this, the short motor arm should be fixed, the other motor arm centrally and the weight, preferably, as far down as possible in the crank point. This gives a sliding movement at such a low mechanical disadvantage. As a consequence, even the normal can be over-exercised on the crank group. In a rising movement, also the weight can be moved upwards to increase the resistance. Further the angular abduction can be increased by moving the crank point outwards on the main fixed quadrant. Later on, the long motor arm should be substituted for the small one, and with it the working movements can be gradually increased to the full amount possible.

IV—STATISTICS OF WORK DONE IN PHYSIO THERAPEUTIC DEPARTMENTS

The following tables have been compiled which show the work done at the Naval Hospitals at Charleston, Hawaii, and Fremont.

1—U. S. Hospital, Charleston

Type of work	Cases treated		Daily average number of patients
	—	—	
1934 6th quarter	155	5,000	85
1935 1st quarter	201	5,000	85
2nd "	225	4,750	81
3rd "	275	5,250	88
4th "	300	5,500	100
1935 1st quarter	200	4,000	74
2nd "	201	4,750	86
3rd "	215	5,500	91
4th "	271	5,000	73
1937 1st quarter	200	5,000	74
2nd "	272	4,000	80
3rd "	257	14,140	103
4th "	251	10,000	171
1938 2nd quarter	176	17,761	103
3rd "	200	12,000	100
4th "	230	14,140	100
4th "	250	14,704	100
	1,904	148,117	

11.—H. S. Hospital, Boston

		Average	Applied	Total
		1914	1915	1916
1913	1st quarter	221	279	291
1914	1st quarter	210	270	280
	2nd "	210	270	280
	3rd "	210	270	280
	4th "	210	270	280
1915	1st quarter	209	269	279
	2nd "	209	269	279
	3rd "	209	269	279
	4th "	209	269	279
1916	1st quarter	208	268	278
	2nd "	208	268	278
	3rd "	208	268	278
	4th "	208	268	278
1917	1st quarter	207	267	277
	2nd "	207	267	277
	3rd "	207	267	277
	4th "	207	267	277
1918	1st quarter	206	266	276
	2nd "	206	266	276
	3rd "	206	266	276
	4th "	206	266	276
		206	266	276

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		Concentration	Application	Reference
	1% W/v	—	—	—
1111	100 g/g water	0.50	1.64 ^a	10
1111	100 g/g water	0.5	2.47 ^b	10
	—	0.25	0.27 ^b	10
	—	0.125	0.50 ^b	11
	10	50%	1.50 ^b	—
1112	1.1 g/g water	0.5	3.46 ^b	10
	—	0.25	1.65 ^b	10
	100	0.1	0.39 ^b	10
	—	0.05	0.49 ^b	10
1113	100 g/g water	0.50	0.15 ^a	10
	—	0.25	0.50 ^b	10
	—	0.125	7.35 ^b	10
	100	0.05	9.51 ^b	11
1115	100 g/g water	0.10	11.51 ^b	10
	100	0.05	10.5 ^b	10
	200	0.1	10.29 ^b	10
	100	0.5	1.21 ^b	10
		10%	100	—

Massage and Electro-Therapeutic Treatment carried out at Royal Naval Auxiliary Hospital, Poole.**For first year : i.e., from January 22, 1915 to January 22, 1916**

Treatment	Number of patients treated	Daily average
Massage—		
Local and general	5,152	26.94
Electro- ¹ A —		
Galvanic Faradism and Sarsacidal	4,179	21.49
Electro- ² B —		
High frequency, static, induction and direct heat	7,058	34.45
Baths—		
Hot-air, sulphur, bromine and iodine, general		
douching, Naeborn and pine	3,576	18.60
Packs—		
Hot-water, Paraffin & Eucalypt	844	4.13
Grand total	51,815	268.8
One year — 312 days (working days)		

Massage and Electro-Therapeutic Treatment carried out at Royal Naval Auxiliary Hospital, Poole.**For First Half of Second Year : i.e., from January 25, 1916 to July 22, 1917 inclusive**

Treatment	Number of patients treated	Daily average
Massage—		
Local and general	9,740	26.97
Electro- ¹ A —		
Galvanic Faradism and Sarsacidal	1,070	6.95
Electro- ² B —		
High frequency, static, induction and radiant heat	3,108	15.49
Baths—		
Hot-air, sulphur, bromine and iodine Naeborn pine, general douching	832	7.64
Packs—		
Hot-water and Paraffin & Eucalypt	142	3.62
Grand total	15,892	158.8
Half year — 158 days (working days)		

EDITORIAL

Thus, the current numbers of the sixth volume of the *Journal* represent the Ninth Naval Medical Service appears before you, exhibiting much of interest and a new design.

Originally produced under a joint editorship, ours was at first a courageous venture quickly became a successful publication. From July, 1909, the *Journal* has been produced under the able editorship and management of our predecessor, and, when we consider that he alone held the reins, under his many other duties, all the more honest success is here. Gifted with a clear-sighted and impartial judgment, and with a distinct literary ability, the duties of which came entirely to Sargant Lieutenant W. L. Martin, and it is through his untiring efforts that the *Journal* has been brought to the position of a present copyright in the front rank of medical periodicals.

In assuming the joint editorship, we have not inherited the task of maintaining the high standard we have inherited, and we are not without confidence in doing so, if the help we look for is forthcoming from our brother medical officers.

This help can be given in several ways. Firstly, by a considerable narrowing of the number of our subscribers, from whose ranks there has been a natural and not unexpected falling off due to the after-war demobilization of temporary officers and the active retirement of some permanent officers.

The welfare of the *Journal* depends upon fresh support from these permanent officers who have not yet become subscribers.

Secondly and of no less importance help can be afforded by the contribution of original articles, clinical notes and other interesting matter. We welcome suggestions for the incorporation of new features in the *Journal* and, in the connection, attention is called to the space devoted to a description of preparations, etc., submitted to us for examination.

One of our most serious wants will be to maintain our credit, and it is, regretted that, for the present, the prevailing abnormal cost of paper and printing makes it impossible for us to reduce the price of the *Journal*.

It is, therefore, with full confidence that we make our appeal to that great all-merciful power which is now looking to the Navy to help us in our task.

The following pages were used as shown previously: a —

Order point — The page became slightly dirty, did not have very good seal and started to light. There was no chlorine or compound, the color was light, the page was a little more. There was slight staining of the page on both sides, the left had a little bit of staining.

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 103–110

1. The first group of patients (11 cases) had a history of trauma, and the second group (11 cases) had a history of infection. The third group (11 cases) had a history of systemic disease, and the fourth group (11 cases) had a history of systemic disease. The fifth group (11 cases) had a history of systemic disease, and the sixth group (11 cases) had a history of systemic disease.

1. The first step is to identify the problem. This involves understanding the current situation and what needs to be changed.

1. \mathcal{H} is a Hilbert space, $\mathcal{H} = \mathcal{H}_1 \oplus \mathcal{H}_2$, $\mathcal{H}_1 \cap \mathcal{H}_2 = \{0\}$, \mathcal{H}_1 and \mathcal{H}_2 are closed subspaces of \mathcal{H} .
 2. \mathcal{H}_1 and \mathcal{H}_2 are separable Hilbert spaces.
 3. \mathcal{H}_1 and \mathcal{H}_2 are isomorphic Hilbert spaces.
 4. \mathcal{H}_1 and \mathcal{H}_2 are not isomorphic Hilbert spaces.
 5. \mathcal{H}_1 and \mathcal{H}_2 are not separable Hilbert spaces.
 6. \mathcal{H}_1 and \mathcal{H}_2 are not closed subspaces of \mathcal{H} .
 7. \mathcal{H}_1 and \mathcal{H}_2 are not orthogonal subspaces of \mathcal{H} .
 8. \mathcal{H}_1 and \mathcal{H}_2 are not complementary subspaces of \mathcal{H} .
 9. \mathcal{H}_1 and \mathcal{H}_2 are not disjoint subspaces of \mathcal{H} .
 10. \mathcal{H}_1 and \mathcal{H}_2 are not identical subspaces of \mathcal{H} .

1. The *log* of the ratio of the number of species in the *i*th size class to the number of species in the *j*th size class is equal to the *log* of the ratio of the number of species in the *i*th size class to the number of species in the *j*th size class. This is a tautology, and it is not clear why it is included in the list of assumptions.

[illegible]

10. The following information is provided for the year ended 31 December 2014:

part. It is not a simple matter to change the order of the letters, and even a small change can result in the image being lost. The only way to ensure that the image is not lost is to use a high-quality printer and a high-quality paper. This is why it is important to use a high-quality printer and a high-quality paper when printing a photograph.

(a) The same logic also has to be employed in such the case, where the approach to a building is done from the side, directly to the side, as in the case of a car. In this case, the approach to the building is done from the side, directly to the side, as in the case of a car.

1) \mathcal{P} -local phenomena. If the point $\mathcal{P}^{(0)} = \mathcal{P}$ does not belong to the set $\mathcal{P}^{(0)}$, and if, conversely, the point \mathcal{P} does not belong to the set $\mathcal{P}^{(0)}$, then the set $\mathcal{P}^{(0)}$ is called the set of \mathcal{P} -local phenomena.

The first investigation was in reaching to (1) the abnormal, unexplained, on-site self-immolation was well brought out by attaching the picture to "Special" of people, it became in regular with the others that I had seen, on the last time was, last, probably on the right side but a little left the agent was also not alone, it was clear and distinctly human and I think was not.

Following the experimental design—these stimuli as an extraordinary and unusual to test. The base price and add-on price as one was would be chosen. And, since all possible items presented at the same time, the price on the left side can be distinguished and difficult to choose. Thus, we suggest increase of the base price on the left side is associated with the sale. The picture is as

was always there, but also varied greatly in the size with which it was closed. On one occasion when the reflexes were tested immediately before and after lunch, patients the knee-jerk became weaker and the plantar reflex diminished after the patients.

Edematous and cystic degeneration were present but slight. There was a well marked toxic effect.

Recovery.—On November 18, the patient complained bitterly that he was again dizzy and began to go on up. This lasted for about half an hour and was the only occasion when there was any complaint suggesting vertigo.

Reactions.—By December 10, tactile, pain and reflex sensibility were distinct but there were not very satisfactory owing to the patient's mental condition.

Cerebrospinal Fluid.—The cerebrospinal fluid obtained by lumbar puncture on November 17 and 18 changed under repeated removal, the fluid was clear, hardly alkaline up to 1908. Some mucous pieces occurred in protein content. Sugar content normal. Some traces of cells of which 60 per cent were lymphocytes. No organisms found either in culture or in culture.

Blood Count.—A leucocyte count done on November 18 gave the following result. Total a leuc 10,300 per c mm.

Differential	Polymorphonuclears	—	76 per cent
	Eosinophils	—	15 "
	Large lymphocytes	—	11 "
	Transitional	—	—
	Small lymphocytes	—	19 "

The increase of eosinophils was explained a few days later when the patient passed about two feet of ageratum.

On November 19, under a general anæsthetic most distressing spasms were very trying continued by Thompson, Eugene Loomis, J. E. Pugh, R.N., the wound was opened up and then removed to a. Instructed assistants were to expose the brain more and the dura more and better it. The dura in the exposed and lateral parts was lifted and left the flaps covered which was controlled by a gauze plug. The dura, pinched and folded slightly downward before the wound. At this stage the patient suddenly collapsed, the eyes pointing to various and respiratory failure, and the patient had to be turned off the table.

On the follow-up day the patient was more drowsy there was some incoherence of the eyes to the right and left movements, the right eye being turned to the right when the left eye was brought to the mid line. The left pupil was larger than the right and reacted more sluggishly to light. The sensation of the lower half recovered.

The dura was removed before the wound and the cerebellum folded into the wound. On dressing it a more foreign body appeared, pus and necrotic brain tissue were removed. A drainage tube was inserted.

There was marked improvement for two days. The pulse remained about 100 per minute. The patient became much more rational, answered questions readily, became interested in his surroundings and even tried to be moved back to the general ward.

Reoperation was not long recommended, however, and from the evening of November 22 his condition steadily deteriorated. He became comatose on the night of November 24 and died on the morning of November 25.

Post-Mortem.—The left lobe of the cerebellum was occupied by a large chronic abscess, the wall of which consisted of soft granular brain tissue. There was no knowledge of pus and the abscess opening opened slightly. There was no evidence of extension of meningitis. All the meninges were thickened with considerable masses of their fluid. Except for slight edema the rest of the brain was normal in the entire eye.

I have to thank Surgeon Captain J. E. Shackleton, R.N., for permission to publish this case.

THE NAVAL SERVICE CANVAS COOT

By Herbert Charles G. G. HERBERT D. R. 1910

Among the past work pieces I have had in the past, one a canvas coot made on the model of the ordinary naval coot and but reduced in width. The pattern is large and gang stage has proved it of real value being constructed from 12 W. King I can have no further opportunity of testing the coot.

When writing in 12 W. King Notes 1895 to 1910, I observed that the coot was common and was commonly used for the head stage, also it was found impracticable to put the coot inside the sides of a pattern form or along gangways and gangways, when width was considered better.

The Commander at my request gave notice that an experimental pattern coot should be made, the width being 10 ft. 11 in. long and 20 in. wide. The coot was covering was made of the same pattern as the ordinary coot, sufficient modification of the top covering—made as a flag to cover the head of the pattern if desirable. As regards bedding a pattern of suitable size was made and it furnished and pattern as provided on the work day.

In Admiralty Weekly Order (1910) October 20, 1908 was given a summary of a Report by Robert Officer of the United States the construction for making of a coot.

Paragraph 10 contains a reference to the ordinary coot, and referring that it is the head and top to be of general utility and recommending that a set of smaller dimensions be employed for the United States Pattern in 12 W. King coot is made and supplied.

The measurements of the smaller coot for the above are as follows:—

Ordinary naval coot was	10 ft. x 20 in.
Flag, United States	11 ft. 8 in. x 21 in.
Small coot was	10 ft. 11 in. x 20 in.

I suggest that no coot frame should be less than 10 ft. long, extension of it will increase the necessity for simple length.

As regards further extension I consider the width should be about 20 in. which is practically that of the first coot frame structure and of the ordinary coot structure.

Two pairs of rope grommets for rope binding have been fixed to the sides of the coot, as before in the former field structure.

If the coot is to be used in a coot structure, though its employment is obviously increased a coot structure, 21 in. wide, would be possible in the present field coot structure, pattern.

Opinions and experience may differ as to the relative use of a coot or a canvas coot.

On the other hand, all structures have a width of about 20 in. to 21 in. a coot in the horizontal with lightness in the structure a coot about 21 in. wide, an oblique head structure being 21 in.

No then in making use of a coot on the structure, as regards width, pattern, that is which it will be substituted.

A small advantage of the coot was in that it occupies approximately the same space as the coot above mentioned, and is consequently more or less interchangeable with them.

Measurements of the ordinary pattern Coot G1

The space required for storage of coot and bedding is very considerable, even in the present coot coot are required to handle it.

It is the wide to be constructed along gangways and gangways especially in small work.

It is the wide to enter the sides of an ordinary coot, head, or the door of a coot structure.

The two π^0 and π^{\pm} placed on the same chamber, i.e. usually the 1, 2, or 3 chamber, are the undetected pion; the central gauge is 1.8 usually or, for example, so that the microstate frequently can see the beam and find π^0 at the top or side to give more space.

11. *Journal of the American Statistical Association*, 93(443), 1089-1092.

Journal of Management Inquiry 20(4) 403-418

The above considerations affecting the industry will also apply to the future

The storage space for gas and bedding is maximally increased. A storage container can be folded, thus allowing the storage of optical instruments in small spaces.

Without pull-out, it can be extremely handled by one man. Under use of
hundreds of workers can be done in considerable less time.

Experiments have shown that the eye, and more commonly the hand, when necessary with the first Holmium activities, refuse to deal with any type of patient under any conditions—no large or small shape, water alone or be required to show hospital. The experienced web health centers of Holmium teams and hospital ships have concluded that of better hands and conditions.

to the rule they also can have preventable movement from a starting point of rest. The patients themselves begin, need to be helped, or back-pedal the way you would. They state they will not have the initial 600 and then disturb the bedline, the increased length of the sensation.

As a consequence, the authors conclude that the use of the proposed model can be a useful tool for the design of a new system, or for the redesign of an existing system, in order to improve its performance.

A grey colour with bristled tips was usually recorded on the bases of the legs. On the dorsum it was elongated and conveyed in the last sternites with the following:

It was found that had been in use, it could not have been brought under cover of the 14-inch deck to the deckhouse but must have been positioned on the open upper deck. Moreover, because of the gap at Chertanawapung it could not have been subsequently placed on the ordinary catwalks used to survey the platform in the lower harbor. (Exhibit)

While a well-timed sale of some stock is clearly a preferable way to reduce the number of open standing puts on the table (see Fig. 2), there is one caveat: unless a large proportion of the available options are sold in the case they are placed on their laptops then the simulation can be biased. In my experiments, if at least 50% of the 100 puttings on each firm's open standing puts surface, then the simulation results are not biased. In other words, if the average sale of the open standing puts is at least 50% per firm, then the simulation results are unbiased. In my experiments, the average sale of the open standing puts is at least 50% per firm, then the simulation results are unbiased. In my experiments, the average sale of the open standing puts is at least 50% per firm, then the simulation results are unbiased.

Personally, I should prefer a large variety to be engaged with a score or more of short narrow spots, less of the ground with pattern and, to less even of the standing rule to the rest by itself. Looking regard to their general adaptability and convenience, the reduced design will display more required and the fact that there exists in accordance with other knowledge or direction.

Abstract

File Name: C:\Program Files\Microsoft Office\Office\Word\Word.doc

From 1944 until 1948 he was in the R.N. Hospital, South Queensland, and in 1948 he was transferred to the R.N. Hospital, Sydney.

Five near history of illness—A. W. L., states, same with H. M. S. died on November 26 1948, with cancer of right side of chest. It had metastasized to brain, but died a week ago. Temperature 100° F. Saw about six more of a family with a black color to necks, and surrounded by a ring of vesicles. (1)

REVIEWS

MAN, or, THE HISTORY OF MANKIND. By J. M. Casselton, C.M.D., M.D., and Albert Chalmers, M.D., F.R.S. Third Edition. London: Baillière Tindall and Cox, 1928. In 1, bound plates and 508 figures. Pp. i + 3,168. Price 15s. net.

The currency of a third edition of this manual shows that it fills a very important place in medical literature. The fact that the last edition had been out of print for some years, necessitated a thorough revision of various chapters and a few have been entirely rewritten. This has resulted in very considerable increase in size, there being now 3,168 pages as against 2,712 as well as the introduction of many new plates and figures. The whole is a very complete but carefully edited, difficult to misinterpret text, with constant illustrations. It would be advantageous to divide this into two which could easily be done keeping Parts I and II separate from Part III. Great credit must be done to the able and capable workmen who prepared it.

As a whole the work is one of very great value and importance but the scientific substance for reading, not type, and arranging in suitable form will become a task which may not have generally accepted would render this part of the work very unhelpful for the ordinary student. However the work of manual form a historical point of view is an enormous task done where, although not at best satisfactory.

The classification of the various chapters is not however very completely changed, "Anatomy" being used by Malpas. Dr. There is very great need to get rid of the old system and the present system is likely to be final, but this at least will most probably be accepted. The new introduction to the system is suggested by Chalmers is not likely to be retained for long.

The official part of the work shows the great grasp of generality of the character of all medical diseases that they make, present and also part systems almost all the information available. The classification of a chapter on "The Human System" is the most suitable solution.

In a book of reference on medical diseases there is no other that shows so much grasp and is so useful for general study among the large army of medical workers. The ideas of comprehensive must have been enormous and the authors are to be congratulated on this work.

MAN, or, THE HISTORY OF MANKIND. By Dr. H. H. Huxley, B.Sc., D.Sc., D.Phil., and Dr. Albert Chalmers, M.D., F.R.S. Third Edition. London: Baillière Tindall and Cox, 1928. Pp. i + 3,168. Price 15s. net.

There is one of these books now enough everywhere, which you can read with greatest profit and any great pleasure by the not uncountable class of people who are getting just a little out of the past experience in present day life and literature.

In an early chapter the author gives us two or three well written parts in "The History of Mankind" by Dr. Huxley. The new part of the book is a new edition of the history for a more readable and thoughtful series of essays on a variety of subjects in which it is difficult to find. They were in its partially well adapted to their purposes as well as in the last few words of the introduction, nearly to give a stimulus to the thought of others.

A final chapter on the "new problems" (the "new" is *relativum* *comparativum* and *transitivum*) be of great interest, mainly, I believe, to those who are conversant with some of the subject. These chapters are of 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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Control of French Fly on the Salween, Canton and Mad. Journ. N. H. Soc.
September, 1883, vol. 3, no. 34, 35.

The authors give a very interesting account of growth here and show that in its development in *Microtus* with a brownish yellow color of the fur, it is determined by the stage (1) when the central system and its branches (2) have formed and the fur will have a more yellowish (3) *Microtus pennsylvanicus* being the fur color with a reddish or brownish, sometimes more or other (4) *Microtus pennsylvanicus* have a central system of great vessels, followed by one or two more (5) and extending from the center (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100) (101) (102) (103) 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PERMUTATIONS, &c.

THE METHOD OF DETERMINING PERMUTATIONS.

THEOREM. The Method of Determining Permutations, is, to find the number of all possible permutations of a set of letters, or of a set of numbers, or of a set of objects, &c.

This proposition is the general one of all algebra, and is the foundation of all the other propositions of algebra, and is the foundation of all the other sciences.

If $a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z$ be the letters of the alphabet, and the letters of the alphabet be arranged in any order, the number of all possible permutations of the letters of the alphabet is $26!$ (the factorial of 26), which is a number of 26 multiplied by 25 multiplied by 24 multiplied by 23 multiplied by 22 multiplied by 21 multiplied by 20 multiplied by 19 multiplied by 18 multiplied by 17 multiplied by 16 multiplied by 15 multiplied by 14 multiplied by 13 multiplied by 12 multiplied by 11 multiplied by 10 multiplied by 9 multiplied by 8 multiplied by 7 multiplied by 6 multiplied by 5 multiplied by 4 multiplied by 3 multiplied by 2 multiplied by 1.

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THEOREM. The Method of Determining Permutations, is, to find the number of all possible permutations of a set of letters, or of a set of numbers, or of a set of objects, &c. If $a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z$ be the letters of the alphabet, and the letters of the alphabet be arranged in any order, the number of all possible permutations of the letters of the alphabet is $26!$ (the factorial of 26), which is a number of 26 multiplied by 25 multiplied by 24 multiplied by 23 multiplied by 22 multiplied by 21 multiplied by 20 multiplied by 19 multiplied by 18 multiplied by 17 multiplied by 16 multiplied by 15 multiplied by 14 multiplied by 13 multiplied by 12 multiplied by 11 multiplied by 10 multiplied by 9 multiplied by 8 multiplied by 7 multiplied by 6 multiplied by 5 multiplied by 4 multiplied by 3 multiplied by 2 multiplied by 1.

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1. The first of these is the fact that the United States has a large and growing population of people who are not white. This is a result of immigration from other parts of the world, and it is a fact that the United States is becoming more and more of a melting pot. This is a fact that the United States must take into account in its foreign policy, for it is a fact that the United States is becoming more and more of a world power, and it is a fact that the United States must take into account the interests of all the people of the world in its foreign policy.

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Figure 1 consists of five bar charts, labeled (a) through (e), each representing a different demographic variable. The x-axis for all charts lists six age groups: 18-24, 25-34, 35-44, 45-54, 55-64, and 65+. The y-axis represents the percentage of respondents, ranging from 0 to 100. The bars are color-coded: 18-24 (light blue), 25-34 (medium blue), 35-44 (dark blue), 45-54 (teal), 55-64 (light green), and 65+ (dark green).

- (a) Gender: The 25-34 age group has the highest percentage (~45%), followed by 35-44 (~35%) and 45-54 (~25%).
- (b) Education: The 25-34 age group has the highest percentage (~45%), followed by 35-44 (~35%) and 45-54 (~25%).
- (c) Income: The 25-34 age group has the highest percentage (~45%), followed by 35-44 (~35%) and 45-54 (~25%).
- (d) Employment: The 25-34 age group has the highest percentage (~45%), followed by 35-44 (~35%) and 45-54 (~25%).
- (e) Marital Status: The 25-34 age group has the highest percentage (~45%), followed by 35-44 (~35%) and 45-54 (~25%).

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Source: U.S. Census Bureau, *Marriage, Divorce, Remarriage in the 1990s*, Table 1.1.

Copyright © 2004 John Wiley & Sons, Ltd. *J. Polym. Sci. Part A: Polym. Chem.* 42: 1152–1162 (2004)
DOI: 10.1002/pola.20051

© 1996 The mass (epidemiological) studies, particularly, in the field of "Medical Genetics" and "Molecular Epidemiology" are published by

1. A. Initial name of software has not occurred as a "known entity" (approximately 90% of 1000) or a "synonym" (1000) for the software in use. The corresponding difference was, however, 10%.

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The following table shows the amount of the various types of property owned by the various companies and the amount of the various types of property owned by the various companies.

12. If the program is transformed into a program, it is suggested that the program be transformed into a program that is more efficient.

10. The third party, noncommercially used, and the following are present in the present work: (a) the first two, (b) the third, (c) the fourth, (d) the fifth, (e) the sixth, (f) the seventh, (g) the eighth, (h) the ninth, (i) the tenth, (j) the eleventh, (k) the twelfth, (l) the thirteenth, (m) the fourteenth, (n) the fifteenth, (o) the sixteenth, (p) the seventeenth, (q) the eighteenth, (r) the nineteenth, (s) the twentieth, (t) the twenty-first, (u) the twenty-second, (v) the twenty-third, (w) the twenty-fourth, (x) the twenty-fifth, (y) the twenty-sixth, (z) the twenty-seventh, (aa) the twenty-eighth, (ab) the twenty-ninth, (ac) the thirtieth, (ad) the thirty-first, (ae) the thirty-second, (af) the thirty-third, (ag) the thirty-fourth, (ah) the thirty-fifth, (ai) the thirty-sixth, (aj) the thirty-seventh, (ak) the thirty-eighth, (al) the thirty-ninth, (am) the fortieth, (an) the forty-first, (ao) the forty-second, (ap) the forty-third, (aq) the forty-fourth, (ar) the forty-fifth, (as) the forty-sixth, (at) the forty-seventh, (au) the forty-eighth, (av) the forty-ninth, (aw) the fiftieth, (ax) the fifty-first, (ay) the fifty-second, (az) the fifty-third, (ba) the fifty-fourth, (bb) the fifty-fifth, (bc) the fifty-sixth, (bd) the fifty-seventh, (be) the fifty-eighth, (bf) the fifty-ninth, (bg) the sixtieth, (bh) the sixty-first, (bi) the sixty-second, (bj) the sixty-third, (bk) the sixty-fourth, (bl) the sixty-fifth, (bm) the sixty-sixth, (bn) the sixty-seventh, (bo) the sixty-eighth, (bp) the sixty-ninth, (bq) the seventieth, (br) the seventy-first, (bs) the seventy-second, (bt) the seventy-third, (bu) the seventy-fourth, (bv) the seventy-fifth, (bw) the seventy-sixth, (bx) the seventy-seventh, (by) the seventy-eighth, (bz) the seventy-ninth, (ca) the eightieth, (cb) the eighty-first, (cc) the eighty-second, (cd) the eighty-third, (ce) the eighty-fourth, (cf) the eighty-fifth, (cg) the eighty-sixth, (ch) the eighty-seventh, (ci) the eighty-eighth, (cj) the eighty-ninth, (ck) the ninetieth, (cl) the ninety-first, (cm) the ninety-second, (cn) the ninety-third, (co) the ninety-fourth, (cp) the ninety-fifth, (cq) the ninety-sixth, (cr) the ninety-seventh, (cs) the ninety-eighth, (ct) the ninety-ninth, (cu) the hundredth, (cv) the hundred-first, (cw) the hundred-second, (cx) the hundred-third, (cy) the hundred-fourth, (cz) the hundred-fifth, (da) the hundred-sixth, (db) the hundred-seventh, (dc) the hundred-eighth, (dd) the hundred-ninth, (de) the hundred-tenth, (df) the hundred-eleventh, (dg) the hundred-twelfth, (dh) the hundred-thirteenth, (di) the hundred-fourteenth, (dj) the hundred-fifteenth, (dk) the hundred-sixteenth, (dl) the hundred-seventeenth, (dm) the hundred-eighteenth, (dn) the hundred-nineteenth, (do) the hundred-twentieth, (dp) the hundred-twenty-first, (dq) the hundred-twenty-second, (dr) the hundred-twenty-third, (ds) the hundred-twenty-fourth, (dt) the hundred-twenty-fifth, (du) the hundred-twenty-sixth, (dv) the hundred-twenty-seventh, (dw) the hundred-twenty-eighth, (dx) the hundred-twenty-ninth, (dy) the hundred-thirtieth, (dz) the hundred-thirtieth-first, (ea) the hundred-thirtieth-second, (eb) the hundred-thirtieth-third, (ec) the hundred-thirtieth-fourth, (ed) the hundred-thirtieth-fifth, (ee) the hundred-thirtieth-sixth, (ef) the hundred-thirtieth-seventh, (eg) the hundred-thirtieth-eighth, (eh) the hundred-thirtieth-ninth, (ei) the hundred-thirtieth-tenth, (ej) the hundred-thirtieth-eleventh, (ek) the hundred-thirtieth-twelfth, (el) the hundred-thirtieth-thirteenth, (em) the hundred-thirtieth-fourteenth, (en) the hundred-thirtieth-fifteenth, (eo) the hundred-thirtieth-sixteenth, (ep) the hundred-thirtieth-seventeenth, (eq) the hundred-thirtieth-eighteenth, (er) the hundred-thirtieth-nineteenth, (es) the hundred-thirtieth-twentieth, (et) the hundred-thirtieth-twenty-first, (eu) the hundred-thirtieth-twenty-second, (ev) the hundred-thirtieth-twenty-third, (ew) the hundred-thirtieth-twenty-fourth, (ex) the hundred-thirtieth-twenty-fifth, (ey) the hundred-thirtieth-twenty-sixth, (ez) the hundred-thirtieth-twenty-seventh, (fa) the hundred-thirtieth-twenty-eighth, (fb) the hundred-thirtieth-twenty-ninth, (fc) the hundred-thirtieth-thirtieth, (fd) the hundred-thirtieth-thirtieth-first, (fe) the hundred-thirtieth-thirtieth-second, (ff) the hundred-thirtieth-thirtieth-third, (fg) the hundred-thirtieth-thirtieth-fourth, (fh) the hundred-thirtieth-thirtieth-fifth, (fi) the hundred-thirtieth-thirtieth-sixth, (fj) the hundred-thirtieth-thirtieth-seventh, (fk) the hundred-thirtieth-thirtieth-eighth, (fl) the hundred-thirtieth-thirtieth-ninth, (fm) the hundred-thirtieth-thirtieth-tenth, (fn) the hundred-thirtieth-thirtieth-eleventh, (fo) the hundred-thirtieth-thirtieth-twelfth, (fp) the hundred-thirtieth-thirtieth-thirteenth, (fq) the hundred-thirtieth-thirtieth-fourteenth, (fr) the hundred-thirtieth-thirtieth-fifteenth, (fs) the hundred-thirtieth-thirtieth-sixteenth, (ft) the hundred-thirtieth-thirtieth-seventeenth, (fu) the hundred-thirtieth-thirtieth-eighteenth, (fv) the hundred-thirtieth-thirtieth-nineteenth, (fw) the hundred-thirtieth-thirtieth-twentieth, (fx) the hundred-thirtieth-thirtieth-twenty-first, (fy) the hundred-thirtieth-thirtieth-twenty-second, (fz) the hundred-thirtieth-thirtieth-twenty-third, (ga) the hundred-thirtieth-thirtieth-twenty-fourth, (gb) the hundred-thirtieth-thirtieth-twenty-fifth, (gc) the hundred-thirtieth-thirtieth-twenty-sixth, (gd) the hundred-thirtieth-thirtieth-twenty-seventh, (ge) the hundred-thirtieth-thirtieth-twenty-eighth, (gf) the hundred-thirtieth-thirtieth-twenty-ninth, (gg) the hundred-thirtieth-thirtieth-thirtieth, (gh) the hundred-thirtieth-thirtieth-thirtieth-first, (gi) the hundred-thirtieth-thirtieth-thirtieth-second, (gj) the hundred-thirtieth-thirtieth-thirtieth-third, (gk) the hundred-thirtieth-thirtieth-thirtieth-fourth, (gl) the hundred-thirtieth-thirtieth-thirtieth-fifth, (gm) the hundred-thirtieth-thirtieth-thirtieth-sixth, (gn) the hundred-thirtieth-thirtieth-thirtieth-seventh, (go) the hundred-thirtieth-thirtieth-thirtieth-eighth, (gp) the hundred-thirtieth-thirtieth-thirtieth-ninth, (gq) the hundred-thirtieth-thirtieth-thirtieth-tenth, (gr) the hundred-thirtieth-thirtieth-thirtieth-eleventh, (gs) the hundred-thirtieth-thirtieth-thirtieth-twelfth, (gt) the hundred-thirtieth-thirtieth-thirtieth-thirteenth, (gu) the hundred-thirtieth-thirtieth-thirtieth-fourteenth, (gv) the hundred-thirtieth-thirtieth-thirtieth-fifteenth, (gw) the hundred-thirtieth-thirtieth-thirtieth-sixteenth, (gx) the hundred-thirtieth-thirtieth-thirtieth-seventeenth, (gy) the hundred-thirtieth-thirtieth-thirtieth-eighteenth, (gz) the hundred-thirtieth-thirtieth-thirtieth-nineteenth, (ha) the hundred-thirtieth-thirtieth-thirtieth-twentieth, (hb) the hundred-thirtieth-thirtieth-thirtieth-twenty-first, (hc) the hundred-thirtieth-thirtieth-thirtieth-twenty-second, (hd) the hundred-thirtieth-thirtieth-thirtieth-twenty-third, (he) the hundred-thirtieth-thirtieth-thirtieth-twenty-fourth, (hf) the hundred-thirtieth-thirtieth-thirtieth-twenty-fifth, (hg) the hundred-thirtieth-thirtieth-thirtieth-twenty-sixth, (hh) the hundred-thirtieth-thirtieth-thirtieth-twenty-seventh, (hi) the hundred-thirtieth-thirtieth-thirtieth-twenty-eighth, (hj) the hundred-thirtieth-thirtieth-thirtieth-twenty-ninth, (hk) the hundred-thirtieth-thirtieth-thirtieth-thirtieth, (hl) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-first, (hm) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-second, (hn) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-third, (ho) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-fourth, (hp) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-fifth, (hq) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-sixth, (hr) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-seventh, (hs) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-eighth, (ht) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-ninth, (hu) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-tenth, (hv) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-eleventh, (hw) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twelfth, (hx) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirteenth, (hy) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-fourteenth, (hz) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-fifteenth, (ia) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-sixteenth, (ib) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-seventeenth, (ic) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-eighteenth, (id) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-nineteenth, (ie) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twentieth, (if) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-first, (ig) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-second, (ih) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-third, (ii) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-fourth, (ij) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-fifth, (ik) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-sixth, (il) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-seventh, (im) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-eighth, (in) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-twenty-ninth, (io) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth, (ip) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-first, (iq) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-second, (ir) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-third, (is) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fourth, (it) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fifth, (iu) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-sixth, (iv) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-seventh, (iw) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-eighth, (ix) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-ninth, (iy) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-tenth, (iz) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-eleventh, (ja) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twelfth, (jb) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirteenth, (jc) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fourteenth, (jd) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fifteenth, (je) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-sixteenth, (jf) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-seventeenth, (jg) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-eighteenth, (jh) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-nineteenth, (ji) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twentieth, (jj) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-first, (jk) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-second, (jl) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-third, (jm) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-fourth, (jn) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-fifth, (jo) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-sixth, (jp) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-seventh, (jq) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-eighth, (jr) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twenty-ninth, (js) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth, (jt) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-first, (ju) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-second, (jv) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-third, (jw) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fourth, (jx) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fifth, (jy) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-sixth, (jz) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-seventh, (ka) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-eighth, (kb) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-ninth, (kc) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-tenth, (kd) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-eleventh, (ke) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-twelfth, (kf) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirteenth, (kg) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fourteenth, (kh) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-fifteenth, (ki) the hundred-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-thirtieth-sixteenth, (kj) the hundred-thirtieth

By the time they apply to enter the Programme, they should be 18 years of age or older (under 18: 18th November 1999). It is not the applicant's responsibility to verify the age of the child. The age of 18 is the minimum age for a person to enter the Programme as a child or to be admitted to the Programme as a young person. The minimum age for a person to be admitted to the Programme as a young person is 16. Any person under 16 years of age who is admitted to the Programme will be treated as a child. The minimum age for a person to be admitted to the Programme as an adult is 18. The minimum age for a person to be admitted to the Programme as a young person is 16. The minimum age for a person to be admitted to the Programme as a child is 18.

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Journal of the Royal Naval Medical Service.

Original Articles.

ANTI-TYPHOID WORK IN BELGRADE

By ROBERT LAMONT, F. R. C. P. D. D. M.

I ARRIVED in Belgrade in December, 1900, after a most interesting journey through Constantinople, Roumania and part of Hungary to take up my appointment as the General Surgeon with Captain Higgard, to find that there was already a Surgeon Lieutenant in charge of the Naval Hospital, and that I was consequently of a lieutenant.

Edward Sir Ernest Thompson, R. N., who was in command on the Danube, told me to look round and find some occupation that would help the War, and that I proceeded to do.

The condition of things in Belgrade at this period was deplorable. The country had been at war for six years and the city had been shelled, captured and occupied by the enemy, and pillaged by them before their retreat. A great part of the inhabitants were missing, very few things were open and those that were only contained such rubbish as the enemy had not thought it worth while to remove. There was very little food or wood for heating and heating provisions were scarce and living dear and communication with the rest of the world very difficult. The hospitals had been very completely pillaged by the enemy, so that there were very few beds and practically no blankets or bed linen, while the empty wards had been deliberately and liberally infected with fever.

The streets were dirty and well-up, with piles of filth at intervals, which it was impossible to remove as the only wheeled traffic to be seen consisted of a few broken wagons, all horses and carts having been removed by the enemy.

The people were war-weary, and disinclined to take any notice whatever

remedy the state of affairs. One of their headquarters staff said to me: "We are tired of it all, we are back once more in Belgrade. The Government is doing a splendid job but let us rest. Leave it alone and it will all soon right in time. This repeated very well the general feeling. But it was borne out, with the very general measure of a remembrance of the problems of typhus that had swept before us. Only it seemed only and not the thing of the headquarters of the Public Health Service. This was, should it be said, to make it clear and the Public Department gave in. They said yes, on paper to do so but to get a move on things was quite a different matter.

The first step was to make arrangements to burn up the heaps of rubbish, to throw out a simple enough burning on total the large numbers of limbs, much rotted bodies that were to be seen on all days, some. However, I pointed out on possible ways, to lack of transport, a street and below. It seemed to be better not to do such arrangements of the sort that would be and hope for the best.

It was such for below to come to this matter needed a truly deplorable improvement working away, the patients of war. These were quarantined in an old barracks called the Vojna klinika alongside the War Office. Even a century previously, it was a thick-walled, unventilated, badly lighted building that was also being used as the quarantine station and general residence for all Serbian soldiers, passing through Belgrade, who came there to draw their rations and sleep on their way to their own homes.

In a room in this building were interned some 500 prisoners, mostly Serbians though there were also some Germans and Turks many of whom had been prisoners for three years being quite absolutely incredible conditions of filth and misery. Round the room was built up a platform of planks on which they slept as they returned living conditions. They were given no washing facilities and, when once locked in for the night, no further facilities either. The glass of many of the windows was broken, the hole being stuffed up with rags and from the cracks of the walls outside which had skeletons of them on a ledge some 4 ft. below the window it was plain that the walls were being used as latrine walls. The atmosphere in the room was foul, the floor covered with mud, heaps of food and bits of all sorts and the prisoners themselves growing with lice. During the day time they were practically unattended and wandered freely about the yard which was in places as deep as human faces and could easily have stepped straight into the bay as one of them explained once that they were too miserable to do so. One day I saw that to be worked at, considering that there had consisted daily of a pound of bread and half a pound of potato jam per man—with nothing hot and nothing but water to drink. These men looked down curiously and fearfully and conversed with me armed freely with the Serbian soldiers who were compelled to come to the same store in order to get their rations,

and it was not at all that they were a grave potential danger should typhus break out amongst them.

The preliminary factor in the spread of typhus is the body-louse whose transmission also depends upon one person to another. These passengers were, heavily crusting with lice and one or two had almost solved the problem of perpetual motion in their efforts to scratch all portions of their body at once. In one case of extreme cases of one of these unfortunate I found thirty of these "scurvy" lice on his head, which practically every hair on the man's body was festooned with eggs to which even the dust on the floor yielded a generous harvest of lice.



FIG. 1. A. The long-haired man, the "scurvy" lice.

While trying to get this delinquent under control (Fig. 1) one Wilson I found himself a victim of the "scurvy" lice. Wilson was also attempting to do the same sort of work, though the "scurvy" lice thought it was very important to make sure of one of the "scurvy" lice. We promptly joined forces and proceeded to make things worse. We decided, and finally persuaded the "scurvy" lice to agree with us that the "scurvy" lice must be allowed out and the "scurvy" lice gave a little, but were not by the "scurvy" lice that they were "scurvy" from their "scurvy" lice being very little, and that little very expensive, to be found in Delgado. Also there were no "scurvy" lice to be had. The "scurvy" lice was aware of the "scurvy" lice and the "scurvy" lice had been badly punished by the "scurvy" lice and the "scurvy" lice had been badly punished by the "scurvy" lice and the "scurvy" lice had been badly punished by the "scurvy" lice.

We then proceeded to go out and look for "scurvy" lice. While searching lighters full of material of all sorts in the store, we came across several

showing signs of fever and lameness (a possible typhoid, rheumatism) which diseases were expected in the mud and water. The day as ended by the same old tired feeling, but no sleep was promptly obtained here. The last of the division which it accompanied, and the preliminary approach to the enemy with a very small force, on a charge at last, but, except in the trench fighting, which we shared with the French, the matter was allowed to drop. We also found at Namur, across the Sambre, six divisions (their service pattern) belonging to a Central French nation which was working in Belgium in connection with their returning prisoners of war, and saved two for our own use. Finally, only eight days after we started on our combined campaign, we (as before put up) "baked our first bones" in spite of every difficulty which the suspension of inclement, darkness could put in our way.

The next day we heard that some cases of typhus had been admitted to the military hospital and went up to make inquiries. We were informed that the Public Health Department had the matter in hand, and, on going there, we were told that the cases had occurred at a sugar factory some four miles out of the town, where the Hungarian prisoners of war were quarantined. We were further shown an official report that the place had been visited by the doctor who had written the report, that he had disinfectant it and everybody there, and that a quarantine had been established with armed sentries to prevent people approaching the place.

We went out to verify the report and found that there were no Hungarian prisoners there, but only laborers; that no case of typhus had occurred amongst them; that no doctor had visited the place; that no disinfection had been carried out and that there were no sentries on the place! All the rather shock us. But in human nature and still deeper and more we returned to the Tyne Station to find that immediately our backs were turned all work had ceased, and that the few prisoners who had been "detained" had been sent back into the dirty room to mix with the others!

This was the last straw and, springing for a fight, we went to interview the War Minister. We pointed out the seriousness of the situation to him, but were completely defeated by his reply that "Typhus does not matter, after all we have no sentries to do!" He however promised to appoint a liaison officer to work with us. We stipulated that he should not be a doctor, as all the military doctors we had met were past masters in the art of concealment and procrastination, and that he should talk either French or German or both—but not English. By the evening we should be able to discuss matters amongst ourselves without "giving the show away" to our liaison officer.

Early the next morning he arrived as the private of Captain Davis, formerly an infantry officer who had been a prisoner of war in Austria for three years and was subsequently operated on in a French hospital,

with his culture. In a particular. He was a really most aggressive head, a thing which I also distrust of someone treacherous and spite French and treacherous. To think he always spoke German and in his French seriously translating each remark from the one language into the other for the benefit of all concerned—a multiplying habit of translation that occasionally really drove us to frenzy. If bored, he got his languages mixed, and produced a polyglot sentence, a really good example of which was the following: "Diese Amerikaner sind dumm in dem [referring to some proposed arrangements to have rabbits]. He also had a power to present the wrong reports in any and every subject, and a constant evasion to walking or any other violent form of exercise. However he soon fell into our ways and, having no doubt identified us as the Anglo-Saxon Invader who must be humiliated, settled down to carry out our orders and give us every assistance in his power. He proved of the greatest assistance to us, and by his honesty, if rather unobsequious, in operations enabled us to get on with the good work.

A further visit to the military hospital in search of the source of the epidemic resulted in our locating the trouble in the rooms of an old shaded factory where the repatriated Czech Slovaks were being cared for by the services mentioned above, and where they were being sent to hospital in ordinary civilian ambulances being used etc.

These ex-prisoners were in a most deplorable state: clothed in rags, the remnants of the uniforms in which they had been captured, with old worn out boots, and some barefoot, they had scraped up through Berlin in the cold winter weather of Central Europe from their prison camps often 200 miles away, with no arrangements for food or accommodation on the way.

The American Red Cross, who had just arrived in Belgarda, kindly supplied us with underclothing for them, and we also obtained mattresses and clean straw from the Berlin authorities. In the history fit-all we rigged up shelter in the converted work the huts, and with a couple of the field disinfectors mentioned above a plentiful supply of soap from the Belgian Field Post and Hygiene in our own private supply we soon had them clean and debauched. But, on the completion of work at the Yipin Hospital, had ceased and a fresh complication had arisen in the occurrence of cases among the civil population. Both Italian, in Germany and German prisoners of war in the Eastern.

It was therefore obvious that, to do the work properly, we had to find some central station capable of performing the task, where all men from infected places could be sent. We were certain that some such station must exist, as Belgarda had been a great military centre during the Austrian campaign, and the Central Kommando had always taken a great interest in questions of disinfection, but no authority, either civil or military, could give us any information on this subject.

We accordingly questioned the town in our car and finally, in a walk of

some 1,000 feet inside, almost to the very point of Sydney Street, a building marked "Dunlop Street Australia." It was surrounded by a fence which we soon scaled, and with system engineers of the establishment, a few old hands such as Lawrence Webb, we procured admittance to the building, which proved to be just what we wanted (Fig. 3). It contained two large double doors of the Washington type, made by a German firm, in good condition except that the Americans, just before they evacuated the town, removed the steam pipes connecting them to the boiler in order that they could be blown out. The old men assured us that they could not be replaced, but with the help of an E. B. L. from Alpha the job was completed in twenty-four

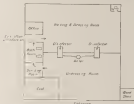


Fig. 3.

hours. I am, then, once more tried to find out the responsible authorities to whom the work had to be referred. Both the military and civil authorities refused to say it was impossible to do any work there owing to lack of civil water and electric light. The two latter the Major had convinced for us and he also gave us a telephone which proved very useful. The former we obtained from Admiral Troubridge who possessed the only coal supply in Singapore, it having been brought up the river by the jugs of the Margate of the Dundee, which he controlled. We also commandeered a certain amount of wood from the military authorities and being ready to begin work declared, in virtue of the authority conferred on us by General Bennett, the War Minister, and by the Minister of Public Health, that this was the Central Engineering

Station. We proceeded to send our liaison officers round to tell all competent military authorities to send us no soldiers for disinfecting.

It was at this point that our real troubles began. With very few exceptions, the commanding officers of the units gave orders to their adjutants to send men without saying that these orders were carried out, and it required enormous patience and inspection visits to all and sundry to get men to the station. We began by sending up personally the gentlemen and gentlemen of the *Vieja Guardia*, and having detained them, we kept our soldiers on a permanent working party at the station. Thus we did to ensure continuity of method, in preference to the rapidly Bolivian style of sending on fresh men who have nothing about it every morning, which was proposed to us by the Commandant *J. Rojas* of the *Vieja Guardia*.

The workers adopted was simple and expeditious. The parties of men to be disinfectated were marched into the yard, where they waited patiently in the sun and cold until identified fifty at a time to the station. During this period they dropped each others' hats, shirts with knee slippers of which we had six sets. On coming inside they stripped and laid their clothes up on benches which were placed in the disinfectors. They then passed into the waiting room in parties of six, where they were examined to see that they had not cut and thrust into the bushes, where they had a thorough wash in cold and water, and thrust into the waiting and dressing room.

The clothes were kept in the disinfectors for a minimum of thirty minutes. We found by practical experiments with hen and egg on glass plates that nothing less was certain in its effect. In the course of a week things were running smoothly, and soldiers for disinfecting were coming along at the rate of 300 to 500 a day, but by that time Spanish men were appearing among the work population. With our medical station coming suddenly under another liaison officer whom we had acquired, and with the *Opus* doctor leaving when his own people in a very thoroughly efficient manner, we were able to turn our attention to the phase of the matter.

The Medical Officer of Health kept us informed by telephone of all houses where cases had occurred. He warned us that these houses were always efficiently disinfected by his men, but we found that this disinfection consisted in getting bedding from coverings, i.e., cut in the sun and sprinkling the inside of the bedding with a solution of chloride of lime—a typically Bolivian disinfectant recipe. Accordingly we gathered in his staff, supplied them with supplies from our supply warehouse above and personally supervised the disinfection of each house. All bedding, &c., was brought in a sanctified ambulance, which we found in a park of dressed pine and put on running order and which was washed down with lye after each trip together with the adjutants of the house, to the disinfecting station. When women and children came, the *Amoroso Red Cross* always went on a point to suppress operations. We came out to the conclusion that a considerable amount of infection was being caused by

repatriated Barboson soldiers, to London, suffering from United Europe, and also by presence of men of various persuasions - clerical and secular - Huggins for the most part, one - sometimes there was an influx from Southern Africa to their own country. Being - willingly made our place to trap them as they passed through - as men, after coming to the capital men of the Barboson authorities. The names of soldiers were all supposed to report to the Yogan Islands for release and a permit to proceed, but very rarely did they, as doing so not subsequently meant a delay of days before the permit could be obtained. They therefore preferred to sleep a night huddled upon the floor in the warmth of some small side-chamber, and proceed in the morning on the initial stage of a walk home, which not infrequently meant a distance of anything up to 40 miles, carrying their few worldly possessions on their backs.

When one remembers that a house will always have a room where temperature is up to the heat of a man in the early stages of typhus, to go to another with a normal temperature it is easy to see how the prisoners clung to overcrowded places tended to spread the disease.

To catch the soldiers we established a house officer at head, across the river, who collected the soldiers and put them in lighters which were towed across by the ferries. On landing, they were marched out to one station, where, after distribution, they were given a permit to proceed, which on presentation in the customs in the Yogan Islands, procured them about ten days' leave from and ten from a considerable of the English-Harfield Customs, an institution started by Miss Helen Harfield and the Rev. Mr. Harfield. This local branch was run by Miss Harfield, a Frenchman and the most remarkable woman I have ever met. Always ready to do anything for the cause, she fell in with cheerily with our scheme for sending these soldiers home without authority, and by sheer force of personality, she took an uncompleted building in the yard of the Yogan Islands, and begged for wood, and made all that was necessary to complete it. With the help of her Barboson soldiers who loved her and did anything for her, she transformed it into a real home, where any Barboson soldier who possessed one of our following letters could get a roof and a night's rest. Without her co-operation we could have achieved nothing, and whenever we felt depressed or depressed, we dropped in to have a cup of tea at her station, where her cheerful welcome and welcome laugh layed on up more more in every small the work was done. We also had to make arrangements for the repatriated soldiers for whom no accommodation was provided and who accordingly went to the houses of friends or acquaintances on the way distributing the typhus-related loss of Germany and Africa to the houses of Africa. We managed to obtain possession of a house in close proximity to the post, large enough to accommodate about fifty people. Thus we fitted out with the assistance of the Barboson authorities on condition that returning homeless soldiers of the Yogan Islands should be allowed to make their way to a hotel. Thus

was done, with the inevitable result that in a few days, the place was in a shambles in the practical sense. We could get no control established, so that visitors arrived upon nights days without having been admitted and passed on.

I was discussing this matter one day with Brigadier General Forrester, U. S., the head of the American Hotel Fund, when he very kindly offered to place at my disposal the services of Miss Collins, a lady sanitary engineer who had come up to Delgado to work for him. I promptly consulted her in Chicago, and, with a visiting party of twenty five American premium readers as English-speaking teachers N. C. D., she performed wonders. We found that the men were making bad the paper books and that the water and baths had been used to excess, instead of. All bathing clothes had been thrown into the yard, and old clothes when discarded were thrown out of the windows and, being caught on the branches of trees, made a business of unsightly signs that flapped monstrously in every breeze. All this was cleaned up by Miss Collins, who also put on all institutions and libraries the disinfectant in two cases of typhus had already occurred there. In addition, she established a proper control on people passing through making them wait in line for delivery, and not allowing them to sleep in the place without one of our tickets. As an example of the amount of personal supervision that work required and the difficulties to be overcome, the following incidents are worth recording. When the institutions and libraries were being sent to us for disinfection a motor lorry was sent down and looked into the pavement into them from the windows up where the windows were thrown, and in Miss Collins's opinion she saw "badness" outside in the street helping themselves to blankets, which they started to carry away. She immediately went in person and returned them, and as before always stood up to see them loaded and unloaded. Further, when we were having the baths and dress room on, we could only get workmen by a personal appeal to the Miras and when they delivered, they proceeded to put in small pieces of water piping that led in and from nowhere. So Miss Collins had to supervise this work personally as well.

When, in addition, our remembrance that she knew no foreign language and was a stranger in a new country, and that she made time to give lessons in English to each of the students that came to come to her in her spare time, I consider that the work she accomplished was deserving of every praise.

In connection with the scheme for sending returning students and prisoners, we established a delaying station at Mochate, the Headquarters of Mexico, on the line about forty miles from Delgado, as well as one at Guadalupe on the Pacific about thirty miles below Delgado for the delaying of returning Polish and other prisoners who came there to get the ordinary passport stamps for Delgado. Each these stations as well as many others in Northern Mexico were staffed by the personnel of the American Red Cross, to whom, and to Colonel T. W. Farnham, the Com-



Fig. 1



Fig. 2

United States Army, Department of War



Fig. 1. A person in the Heligraaf.



Fig. 2. A group of people in the Heligraaf.

prison camp in Smederevo. It seems that just after the arrival of the epidemic at Belgrade, there were no symptoms of typhoid, although it had been brought together with the thousands of Polish prisoners who were taken over the river and still had their own food. The reason for this proved was the moral we had experienced. The ground was quite flat and as there was a continuous north-easterly wind, with 15 to 20 inches of frost. They had been two months on the road, their boots were worn out and so many instances replaced by pieces of canvas laid round the feet (figs 1 and 2). They had for clothing nothing but the remnants of the summer clothing, in which they had been captured, though some possessed pieces of blanket (figs 3 and 4), stolen or ready to wrap round their shoulders. No arrangements had been made for their feeding or sleeping accommodation or rest, as they had neither which food they could in any matter in a well-stocked country in the depths of winter and sleep anywhere, huddled together for warmth. The drink that came from the meat of worn-out horses nearly made us sick. In spite of protests and opposition from the Serbian authorities, we concentrated from the army stores sufficient underclothing and boots to fit them out and after disembarking took them down to Merhametova for soap and tea, which the Poles had secured on way. The first hot meal most of them had had for two months. We also arranged with a Polish captain at Smederevo to give them a hot meal before they proceeded by train to Belgrade, so we were not wrong with some difficulty from the authorities in Vienna, there to receive their weary troops to fit all of them, where it was quite possible that their horses had been starved, if not swept away in the tide of war.

Our work attracted a certain amount of attention, not only on shore, but also on the river. The following articles in *Pravda*, a leading Polish daily paper, are fair samples. Under the heading "Polish Heroes" is published an article entitled "Measures taken in combat typhoid in Belgrade" which runs as follows:—"That the possibility of another outbreak of the terrible epidemic of typhoid similar to that of 1911 and 1912, is not excluded is proved by the recent appearance of the disease among the Czech-Slovak prisoners of war who are being sent back to Czechoslovakia as well as of some cases in the Army and civil population. Fortunately, it seems that the spread of the disease is under control, and all civil and military authorities have been asked to co-operate in the work."

The Czech-Slovak mission has proved very active in confining the epidemic among its captives. Colonel Major L. F. Dupa, of the French Navy and Colonel Captain Inayat of the Austrian Engineers have an agreement with the Serbian Government, organized a central disinfecting station, no ground allotted to them by the Municipality of Belgrade, for the purpose of preventing the spread of the disease, where they are now delivering 600 doses a day. It is to be hoped that all interested authorities will render every assistance to these valiant foreigners in their noble work."



FIG. 1.



FIG. 2.

(1888, at gathering place)

Another battle came!—Belgrade Island. A *Contestacion* by a "Coma" was written in a light sea, as follows: I was born in January 1874, in the Yago Islands at Belgrade of a noble family, the first of which season of a trial with a spot of blood in the forehead. I soon had some prisoners of war and soldiers of the prison, all of them dead. But various seasons were begun to prosecute as we immediately that we were finally was exterminated. A season almost over before I think that I have arrived.

When the Austrians came they were largely armed. They captured a great number and started on out everywhere. But it did not last long, as they were defeated by the blacks, which gained a great relief especially for me, as they were dependent on, before recovery for fighting us. Gradually our numbers again increased. I returned and reformed my house long before the Austrians, and gained a large war indemnity from the hands of the prisoners.

Now my prospects are better than ever, though life before the black time was hard. But when our army came back life was no longer hard of hunting and torment. There were no prizes, no temptations, no doctors, no other beds, no beds or camp. Our numbers developed with blackened exceedingly. Many young beds here, just as I have other quarters, here various fruits and many of vegetables, and wine—God be praised!—were here as well that it could not be better. When the small group too big for the Yago Islands, we started making a journey to various districts. We go off separately with soldiers who come to fight the various and have they revealed various segments with great success.

The English are trying to organize nations against us, but they are hampered by various theories and misadministration, in the support we are now so powerful that our victory is certain and we expect that, as we nearly always over fire and victory.

We also had many visitors at the Delmarva Station, among them Colonel Vostrebitch, the leading Russian surgeon, head of the Civil Hospital in Belgrade who was very interested in the subject. He had been through the problems of 1914-1915 on which he wrote a paper that was published in the *Lancet* and appreciated the importance of the work. More than half the doctors in Vienna had either died or left as have killed in the war, and the few that were left in Belgrade were fully occupied in other work, and had no time to assist us.

The cases as a general rule were out of a new type, and the mortality was not high. The spread of the epidemic, was, no doubt, largely limited by the fact that a large proportion of the population had already had the disease, and still more by the fact that methods of communication were very difficult. All the railways had been destroyed by the enemy, as these routes and the great majority of wheeled vehicles, horses and draught cattle removed, so that walking was the only means of getting about, and this in the hot summer weather was only restricted to a small of absolute necessity.

With regard to results obtained it is difficult to speak with any certainty. The facts are that, before we took up the work, there had been a sixty-five cases of typhus in Belgrade (mostly among hospitalized Czechs). During the first five weeks we delivered upwards of 25,000 doses. During this period there were only thirty-seven fresh cases, though it was the coldest weather we experienced during that winter and the whole of Northern Serbia was full of typhus victims. There were several instances in which a segment of an establishment branched out as two cases, and after immediate delousing no further cases appeared. Of the thirty-seven fresh cases that appeared after we began our work, twenty declared themselves in the first week. Major Stacey and I both left within a short interval, and the work was carried on by Captain Anderson of the American Red Cross till the advent of the warmer weather in May brought it to a stop.

The work was hard but interesting and afforded opportunities of getting us straight into the character, beliefs and point of view of the Serbian people under conditions that was not likely to occur.

As to the future it seems extremely probable that typhus will remain endemic at epidemic outbreaks throughout Northern Serbia for many years to come, but that, with energetic handling of such small outbreaks, any further pandemic work as that of 1914, should not occur at any rate in our generation.

OBSERVATIONS ON THE WILLINGNESS OF APPREHENSION
IN INDIAN CHILDREN

By JAMES HARRISON, M.D., F.R.S.E., F.R.S.D.

In view of the paucity of observations relating to the willing-ness of apprehension and its associated psychomotor activity, that of two members of the Royal Naval Hospital, approached me, being very well equipped in medicine, might be desired to estimate the readiness of apprehension in the young, in spite of that of training ships. Having neither agreed to this suggestion, and the matter was appointed to D.M. Training Ship Hospital at Devonport for this purpose.

The methods adopted in the research was those employed by Gellhorn and Orr in their investigations on 'The Energy Expenditure of the Infantry Troop in Training' (Official Paper 1918) and, detailed in Gellhorn's paper on the *Journal of the Royal Army Medical Corps*, November, 1920.

An effort was made to determine the respiratory exchanges of a number of boys during rest and while employed in carrying out various duties included in the day's work. By this means it was hoped to arrive at an average figure for the energy output of a boy between the ages of 15 and 17 under the conditions in which he lives in the training ship.

The observations were taken during the period, July 2 to December 7, 1918. Owing to the ships being down the observations are very far from sufficient in number to provide material for very accurate studies. The results obtained, however, in details of day after observations of the same kind may serve as a guide to the best requirements of this class of children. As a control of the observations by the Douglas-Halliday method the food intake was recorded from the diet charts and from the supply of food. The caloric value of the food was estimated and the average daily intake per boy calculated.

1.—DETAILS OF JAMES HARRISON, WRITER AND SUBJECTS.

Twelve boys of a nearly equal class were taken their ages varying from 15 years 3 months to the youngest on commencement of the work and 17 years the oldest on termination. Measurements were taken at the beginning and end of observations, giving the following averages:—

	Food exp.	Total food in (lbs.)	Total weight (lb. lost)
12 boys, July 2 to December 7	790 years 3 months	3 173 1/2	707 500
12	811	3 132 1/2	552 800
Total	1601 years 7 months	6306 1/2	1260 300
Average	133 years 4 months	525 1/2	105 1/2

From these data, the average of the 10 measurements is 1.92 watt-hours per gram of sample (10.0 \pm 0.19 watt-hours).

TABLE I.—MEASUREMENTS OF THE 10.00-Gram Aluminum Oxide Sample (See Note 1)

No.	Description	Average	
		Watt-hours per gram of sample	Standard deviation, %
1	Storing In battery-chamber at 25 p.m. and in daylight	5	1.87
2	Measuring Lying on a surface. This was always taken care to copy other samples during the same day	12	1.88
3	Seizing On white work bench	15	1.89
4	Seizing at restriction On bench without back	20	1.90
5	Measuring	11	1.85
6	Measuring and handling Holding on desk, viewing three meters on various articles of his	5	1.85
7	Measuring and handling Laying out on his suspension	3	1.85
8	Measuring Stays, yards per minute	16	1.90
9	Measuring and handling Stays, yards per minute	2	1.89
10	Measuring and handling Stays, yards per minute	9	1.88
11	Measuring Stays, yards per minute	11	1.81
12	Measuring Stays, yards per minute	8	1.87

III—EXTENSION OF DATA OBTAIN

On the basis of the preceding observations, an attempt has been made to extend the output for an average day for an average day following the daily routine of the ship from 5 p.m. one day to 5 p.m. the next day.

Time/Activity	Location	Area	Personnel	Equipment	Notes
12:40 a.m. to 12:45 a.m.	Assembly area	10	1	1	100
12:45 a.m. to 1:00 a.m.	Assembly area	10	1	1	100
1:00 a.m. to 1:15 a.m.	Assembly area	10	1	1	100
1:15 a.m. to 1:30 a.m.	Assembly area	10	1	1	100
1:30 a.m. to 1:45 a.m.	Assembly area	10	1	1	100
1:45 a.m. to 2:00 a.m.	Assembly area	10	1	1	100
2:00 a.m. to 2:15 a.m.	Assembly area	10	1	1	100
2:15 a.m. to 2:30 a.m.	Assembly area	10	1	1	100
2:30 a.m. to 2:45 a.m.	Assembly area	10	1	1	100
2:45 a.m. to 3:00 a.m.	Assembly area	10	1	1	100
3:00 a.m. to 3:15 a.m.	Assembly area	10	1	1	100
3:15 a.m. to 3:30 a.m.	Assembly area	10	1	1	100
3:30 a.m. to 3:45 a.m.	Assembly area	10	1	1	100
3:45 a.m. to 4:00 a.m.	Assembly area	10	1	1	100
4:00 a.m. to 4:15 a.m.	Assembly area	10	1	1	100
4:15 a.m. to 4:30 a.m.	Assembly area	10	1	1	100
4:30 a.m. to 4:45 a.m.	Assembly area	10	1	1	100
4:45 a.m. to 5:00 a.m.	Assembly area	10	1	1	100
5:00 a.m. to 5:15 a.m.	Assembly area	10	1	1	100
5:15 a.m. to 5:30 a.m.	Assembly area	10	1	1	100
5:30 a.m. to 5:45 a.m.	Assembly area	10	1	1	100
5:45 a.m. to 6:00 a.m.	Assembly area	10	1	1	100
6:00 a.m. to 6:15 a.m.	Assembly area	10	1	1	100
6:15 a.m. to 6:30 a.m.	Assembly area	10	1	1	100
6:30 a.m. to 6:45 a.m.	Assembly area	10	1	1	100
6:45 a.m. to 7:00 a.m.	Assembly area	10	1	1	100
7:00 a.m. to 7:15 a.m.	Assembly area	10	1	1	100
7:15 a.m. to 7:30 a.m.	Assembly area	10	1	1	100
7:30 a.m. to 7:45 a.m.	Assembly area	10	1	1	100
7:45 a.m. to 8:00 a.m.	Assembly area	10	1	1	100
8:00 a.m. to 8:15 a.m.	Assembly area	10	1	1	100
8:15 a.m. to 8:30 a.m.	Assembly area	10	1	1	100
8:30 a.m. to 8:45 a.m.	Assembly area	10	1	1	100
8:45 a.m. to 9:00 a.m.	Assembly area	10	1	1	100
9:00 a.m. to 9:15 a.m.	Assembly area	10	1	1	100
9:15 a.m. to 9:30 a.m.	Assembly area	10	1	1	100
9:30 a.m. to 9:45 a.m.	Assembly area	10	1	1	100
9:45 a.m. to 10:00 a.m.	Assembly area	10	1	1	100
10:00 a.m. to 10:15 a.m.	Assembly area	10	1	1	100
10:15 a.m. to 10:30 a.m.	Assembly area	10	1	1	100
10:30 a.m. to 10:45 a.m.	Assembly area	10	1	1	100
10:45 a.m. to 11:00 a.m.	Assembly area	10	1	1	100
11:00 a.m. to 11:15 a.m.	Assembly area	10	1	1	100
11:15 a.m. to 11:30 a.m.	Assembly area	10	1	1	100
11:30 a.m. to 11:45 a.m.	Assembly area	10	1	1	100
11:45 a.m. to 12:00 p.m.	Assembly area	10	1	1	100
12:00 p.m. to 12:15 p.m.	Assembly area	10	1	1	100
12:15 p.m. to 12:30 p.m.	Assembly area	10	1	1	100
12:30 p.m. to 12:45 p.m.	Assembly area	10	1	1	100
12:45 p.m. to 1:00 p.m.	Assembly area	10	1	1	100
1:00 p.m. to 1:15 p.m.	Assembly area	10	1	1	100
1:15 p.m. to 1:30 p.m.	Assembly area	10	1	1	100
1:30 p.m. to 1:45 p.m.	Assembly area	10	1	1	100
1:45 p.m. to 2:00 p.m.	Assembly area	10	1	1	100
2:00 p.m. to 2:15 p.m.	Assembly area	10	1	1	100
2:15 p.m. to 2:30 p.m.	Assembly area	10	1	1	100
2:30 p.m. to 2:45 p.m.	Assembly area	10	1	1	100
2:45 p.m. to 3:00 p.m.	Assembly area	10	1	1	100
3:00 p.m. to 3:15 p.m.	Assembly area	10	1	1	100
3:15 p.m. to 3:30 p.m.	Assembly area	10	1	1	100
3:30 p.m. to 3:45 p.m.	Assembly area	10	1	1	100
3:45 p.m. to 4:00 p.m.	Assembly area	10	1	1	100
4:00 p.m. to 4:15 p.m.	Assembly area	10	1	1	100
4:15 p.m. to 4:30 p.m.	Assembly area	10	1	1	100
4:30 p.m. to 4:45 p.m.	Assembly area	10	1	1	100
4:45 p.m. to 5:00 p.m.	Assembly area	10	1	1	100
5:00 p.m. to 5:15 p.m.	Assembly area	10	1	1	

Table 1. River water temperature (March 15, 1955)

	Polotsk m	Polotsk km	Polotsk hydrost.	Polotsk km
1. Surface temperature (at 10 m m) —				
March 15 m	0.048	0.305	0.048	0.2
March 16 m	0.408	0.045	0.308	0.1
March 17 m	0.148	0.145	0.118	0.1
2. Depth —				
March 1 m	0.284	0.003	—	0.2
March 2 m	0.080	0.080	0.280	0.1
March 3 m	0.580	0.080	0.280	0.2
March 4 m	0.517	0.548	—	0.2
March 5 m	—	—	—	—
March 6 m	1.117	0.758	0.400	1.118
3. Bottom —				
March 1 m	1.420	1.028	—	0.2
March 2 m	0.750	0.048	0.380	0.2
March 3 m	0.400	0.000	1.280	0.2
March 4 m	0.880	0.080	0.170	0.2
March 5 m	0.140	0.080	0.770	0.2
March 6 m	2.410	1.770	0.790	1.410
4. Water pollution (strongest pollution) —				
March 1 m	0.000	1.750	0.040	0.04
March 2 m	0.750	0.000	0.750	0.04
March 3 m	0.000	0.000	—	—
March 4 m	—	—	—	—
March 5 m	1.000	2.000	0.000	0.100
5. Water pollution (strongest pollution) —				
March 1 m	0.000	0.000	0.000	0.00
March 2 m	0.000	0.000	0.000	0.00
March 3 m	0.000	0.000	0.000	0.00
March 4 m	0.000	0.000	0.000	0.00
March 5 m	0.000	0.000	0.000	0.00
March 6 m	0.000	0.000	0.000	0.00
March 7 m	0.000	0.000	0.000	0.00
March 8 m	0.000	0.000	0.000	0.00
March 9 m	0.000	0.000	0.000	0.00
March 10 m	0.000	0.000	0.000	0.00
March 11 m	0.000	0.000	0.000	0.00
March 12 m	0.000	0.000	0.000	0.00
March 13 m	0.000	0.000	0.000	0.00
March 14 m	0.000	0.000	0.000	0.00
March 15 m	0.000	0.000	0.000	0.00
March 16 m	0.000	0.000	0.000	0.00
March 17 m	0.000	0.000	0.000	0.00
March 18 m	0.000	0.000	0.000	0.00
March 19 m	0.000	0.000	0.000	0.00
March 20 m	0.000	0.000	0.000	0.00
March 21 m	0.000	0.000	0.000	0.00
March 22 m	0.000	0.000	0.000	0.00
March 23 m	0.000	0.000	0.000	0.00
March 24 m	0.000	0.000	0.000	0.00
March 25 m	0.000	0.000	0.000	0.00
March 26 m	0.000	0.000	0.000	0.00
March 27 m	0.000	0.000	0.000	0.00
March 28 m	0.000	0.000	0.000	0.00
March 29 m	0.000	0.000	0.000	0.00
March 30 m	0.000	0.000	0.000	0.00
March 31 m	0.000	0.000	0.000	0.00
March 32 m	0.000	0.000	0.000	0.00
March 33 m	0.000	0.000	0.000	0.00
March 34 m	0.000	0.000	0.000	0.00
March 35 m	0.000	0.000	0.000	0.00
March 36 m	0.000	0.000	0.000	0.00
March 37 m	0.000	0.000	0.000	0.00
March 38 m	0.000	0.000	0.000	0.00
March 39 m	0.000	0.000	0.000	0.00
March 40 m	0.000	0.000	0.000	0.00
March 41 m	0.000	0.000	0.000	0.00
March 42 m	0.000	0.000	0.000	0.00
March 43 m	0.000	0.000	0.000	0.00
March 44 m	0.000	0.000	0.000	0.00
March 45 m	0.000	0.000	0.000	0.00
March 46 m	0.000	0.000	0.000	0.00
March 47 m	0.000	0.000	0.000	0.00
March 48 m	0.000	0.000	0.000	0.00
March 49 m	0.000	0.000	0.000	0.00
March 50 m	0.000	0.000	0.000	0.00
March 51 m	0.000	0.000	0.000	0.00
March 52 m	0.000	0.000	0.000	0.00
March 53 m	0.000	0.000	0.000	0.00
March 54 m	0.000	0.000	0.000	0.00
March 55 m	0.000	0.000	0.000	0.00
March 56 m	0.000	0.000	0.000	0.00
March 57 m	0.000	0.000	0.000	0.00
March 58 m	0.000	0.000	0.000	0.00
March 59 m	0.000	0.000	0.000	0.00
March 60 m	0.000	0.000	0.000	0.00
March 61 m	0.000	0.000	0.000	0.00
March 62 m	0.000	0.000	0.000	0.00
March 63 m	0.000	0.000	0.000	0.00
March 64 m	0.000	0.000	0.000	0.00
March 65 m	0.000	0.000	0.000	0.00
March 66 m	0.000	0.000	0.000	0.00
March 67 m	0.000	0.000	0.000	0.00
March 68 m	0.000	0.000	0.000	0.00
March 69 m	0.000	0.000	0.000	0.00
March 70 m	0.000	0.000	0.000	0.00
March 71 m	0.000	0.000	0.000	0.00
March 72 m	0.000	0.000	0.000	0.00
March 73 m	0.000	0.000	0.000	0.00
March 74 m	0.000	0.000	0.000	0.00
March 75 m	0.000	0.000	0.000	0.00
March 76 m	0.000	0.000	0.000	0.00
March 77 m	0.000	0.000	0.000	0.00
March 78 m	0.000	0.000	0.000	0.00
March 79 m	0.000	0.000	0.000	0.00
March 80 m	0.000	0.000	0.000	0.00
March 81 m	0.000	0.000	0.000	0.00
March 82 m	0.000	0.000	0.000	0.00
March 83 m	0.000	0.000	0.000	0.00
March 84 m	0.000	0.000	0.000	0.00
March 85 m	0.000	0.000	0.000	0.00
March 86 m	0.000	0.000	0.000	0.00
March 87 m	0.000	0.000	0.000	0.00
March 88 m	0.000	0.000	0.000	0.00
March 89 m	0.000	0.000	0.000	0.00
March 90 m	0.000	0.000	0.000	0.00
March 91 m	0.000	0.000	0.000	0.00
March 92 m	0.000	0.000	0.000	0.00
March 93 m	0.000	0.000	0.000	0.00
March 94 m	0.000	0.000	0.000	0.00
March 95 m	0.000	0.000	0.000	0.00
March 96 m	0.000	0.000	0.000	0.00
March 97 m	0.000	0.000	0.000	0.00
March 98 m	0.000	0.000	0.000	0.00
March 99 m	0.000	0.000	0.000	0.00
March 100 m	0.000	0.000	0.000	0.00

From 0.000 to 0.000, 0.000, 0.000, 0.000, 0.000

Summary of Data Showing the Change Due to the Introduction of Milk

	1900	1901	1902	1903
March 19—				
Corn and beans, 20,000 lb.	\$ 440	\$ 140	\$ 150	—
Haystack	1 400	0 000	—	—
Dinner	1 750	5 011	—	1 750
Ten	0 500	0 000	1 200	—
Supper	1 000	0 000	—	1 000
	\$ 740	\$ 140	\$ 350	—
March 20—				
Corn and beans	\$ 110	\$ 140	\$ 150	—
Haystack	1 200	1 500	1 500	1 500
Dinner	1 500	0 541	1 000	1 500
Ten	0 500	0 000	1 200	—
Supper	1 000	0 570	1 500	—
	\$ 740	\$ 294	\$ 540	\$ 300
March 21—				
Corn and beans	\$ 140	\$ 140	\$ 150	—
Haystack	1 500	0 000	1 500	—
Dinner	1 500	0 571	1 000	1 500
Ten	1 100	0 541	1 200	—
Supper	0 500	0 570	0 500	—
	\$ 740	\$ 294	\$ 540	\$ 300
March 22—				
Corn and beans	\$ 140	\$ 140	\$ 150	—
Haystack	1 500	1 500	1 500	1 500
Dinner	1 500	0 500	0 500	1 500
Ten	0 500	0 000	0 500	—
Supper	1 500	1 500	0 500	1 500
	\$ 740	\$ 740	\$ 350	\$ 350
March 23—				
Corn and beans	\$ 140	\$ 140	\$ 150	—
Haystack	1 500	1 500	1 500	1 500
Dinner	1 500	1 500	0 500	1 500
Ten	0 500	1 500	0 500	—
Supper	1 500	1 500	1 500	—
	\$ 740	\$ 824	\$ 350	\$ 350

(a) The Measurement of Unemployment by Indirect Estimation

Unemployed (U) and Total (T) 1942

		Unemployed (U)	Unemployed (U)	Unemployed (U)	Total (T)
Monday	11:0	350	175	275	1,000
Tuesday		300	150	225	900
Wednesday	1	315	158	233	903
Thursday	100	315	158	233	903
Friday	100	300	150	225	900
Saturday	100	300	150	225	900
Sunday	100	300	150	225	900
	1000	1,000	1,000	1,000	3,000
	1000	1,000	1,000	1,000	3,000

To check against that the total food for the quarter (August 1 to March 31 1942) has been assessed and no average used.

[illegible]

The present series of trials is a parallel to a similar set of trials conducted with young guinea pigs (1930-31, 1931-32, 1932-33, 1933-34). The subjects lay in the same group, they were well handled, they were regularly weighed individually and physically and were growing rapidly, the difference between successive weights being 50 gms. a week during the first and a half months after which the experiment lasted. The total increase in height of the eleven boys during this time was 55 cm. In calculating their intake it is generally assumed that boys below 14 years age eat, on an average, 2500 calories a day. But even assuming that this level is correct, it is difficult to see how it could be consistently maintained until the beginning of the trial if on that date when energy demands are increased to a considerable extent, of boys of this age, whether it is a 1500 or 2000-calorie diet tends to make their energy output and their food requirements greater than that of one doing the same amount of physical work. It has already been pointed out that the figures obtained from the average energy output could be below the true figures owing to the fact that during these periods, the estimates were not carried out in the double-blind method. It would seem not unreasonable to allow about 150 calories per day for the average expenditure of energy involved in thinking so that it would not be safe to assume, on average energy expenditure of these boys less than 1500 calories per day. Osburn and Orr found for the mature rabbit a daily average expenditure of 4,500 calories and for the rat, 3000 calories. But on these counts there is no evidence that more growth or increase in weight was possible. As it must be regarded as advantageous and physiological that boys of this age should be increasing in height and weight, we are justified in taking 2500 calories as a safe figure. If we add 10 per cent. to this figure to allow for loss in working for the food requirements of a boy in a working shop we get 2750 calories per day which does not differ widely from the intake value of the mature subject in his work in the field. The value then, obtained for the food supply is 4,150 calories, which seems to be rather excessive, but it was not possible to fix a true estimate of the actual value of the average taken away on the small latches. It would seem possible that various economies might be effected without detriment to the welfare and efficiency of the boys. In conclusion I wish to express my thanks to Professor S. H. Stirling of University College, London, for his kindness and great assistance in formulating the conclusions arrived at in this article.

Figure 1. A, B though not connected may be considered as having the same point of origin, distant from the target A .

Figure 2. A, B, C then definable. That angle A, C, D is called the parallel angle. If we are provided to carry a measuring rod as usual, the angle A, C, D . The parallel angle will vary inversely with the angle α which with the greater the angle, the smaller the parallel angle calculated, the base of the ladder.

If we imagine the angle A, B, C approximately 90° and since the lengths A, B and A, C are always great compared with the base length B, C , then we may regard as equal to the distance the base line B, C is parallel suggested.



FIG. 1

Proceeding it will be observed from the second diagram that as the parallel angle or point of convergence changes from B, A, C to B, D, C , so it will be increased by an amount equivalent to the angle A, C, D and the range continuously shortened by the distance A, D . If the object be at infinity A, B and A, C are parallel rays. An interesting article Helmholtz has shown that when the angle A, C, D has a certain numerical value α the points A and D cannot be recognized as being at different distances from the observer and there is no perception of their depth relief.

Actually Helmholtz determined that $\alpha = 1.103^\circ$ was the smallest depth to which objects could be differentiated stereoscopically by an observer at a distance of 640 mm. with an interocular distance of 60 mm. From this it was deduced that the angle $\alpha = 1.103^\circ$ was approximately one minute of arc. In other words referring again to fig. 2 the difference between the parallel angles B, A, C and B, D, C as expressed by the angle A, C, D must have a measure of one minute of arc (the angle $\alpha = 1$) to enable the points A and

But a straight line, mn , drawn, parallel to ac , intersects ab in m , and bc in n , equally distant from b . The figure, $abnm$, is a parallelogram.



The above statement, which, I have shown, is a consequence of our second nature, is, in addition, true, even without our coming through "10." There may be the case of two points in a spectrum, a and b , such that the base length which separates them, the measure of distance,

Corollary of Theorem.

Let a, b, c , be defined, (1) "11" being drawn, it may be made to coincide with the observation made in our 10th paper, and reach the same result as 10. The same result may be made with other line lengths.

(2) "11" being drawn, with a, b, c , the same may be made, (1) separately, in a line, hence is observed, (1) is:

Two *chromatic* Fractions—On looking through the eye glass, the upper and lower fields are seen to be separated by a line, these fields are defined separately by light reflected from the two ends of the base A partial rays, only, in our two ends base and. The production of the line and the formation of these partial rays is affected by (1) separation, prism—(2) a system of reflection.

It is worth, in such cases, to show a part of the ray (F I) in a such line and, in directed and does not reach the observer (B C). A rough description of the first method will suffice here.

In fig. 4 H is a separating prism (C P & D and D E in) parallel, representing from the object A. The rays A B and D E are obliquely falling on the lower portion of the separating prism through nearly an reflection and reach the observer's eye in the direction B C and L F. The ray C P and all rays falling on the upper portion of the separating prism are not reflected equally but in the direction P K and, striking the diaphragm L, are prevented from reaching the observer's eye. The aperture in the diaphragm L is just sufficient to allow axial rays to emerge.

Thus it will be seen that a partial image only reaches the eye from one set of eye-piece prisms. There are two sets of eye-piece prisms, a top and a bottom set, and the function of each is to reflect the rays coming from either end reflector of the rangefinder nearly the position of the image and direct it out towards the eye-piece and eye-piece objective. Thus, at this time when these rays are intercepted by the separating prism so that a part is reflected downwards (in spread as rays coming from the lower set of eye-piece prisms) and stopped by the eye-piece diaphragm and a part reflected upwards forming a partial image of the object.



FIG. 4

The observer then sees two partial images the upper and lower both separated by a line (see). The lower field is fixed whilst the upper field is separable thus adjustability is effected by means of a deflecting prism in the line of rays coming from the right end reflector of the rangefinder.

The construction of the two partial images is defined as follows: the eye and in determining the image is, means of a range scale in the smaller before the scale is read through the left eye-piece by the rangefinder itself whilst a separate scale reader is employed with the larger before.

The geometrical and optical principles defined above may now be summarized shortly in so far as they are applicable to rangefinder design. In fig. 4 A B and C are vertically parallel rays coming from an infinitely distant object striking the two end reflectors of an instrument with a

then to meet in C (Fig. 2). Thus, incident refraction is supposed to be such, that the dispersion found in single images, reflected in C (Fig. 1), already in fact, corresponds to that given in C by its perfect image, and the dispersion in C is supposed to be perfect.

A single image formed due to parallel rays from an infinitely small object will then be perfect and will be in C by $\frac{1}{2}$, thus in the optical axis.



Fig. 1



Fig. 2

within C , by the (Fig. 1) curved reflections are supposed and perfect and the two perfect images (the top A and bottom B) both emerge through the lens (Fig. 1) and in C by the (Fig. 2) is infinitely, and there is the (Fig. 2).

However, upon C (Fig. 1) and A the angle $A B C$ may be regarded as a constant (Fig. 1) by the (Fig. 2) part of image from the (Fig. 1).

straight line AB is drawn in position. Unphysical distances between A and B are introduced in order to describe the position of the rays. The rays are represented by straight lines and the distance in the plane that is perpendicular to the plane of the rays.

By the definition of A and B the position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.

Therefore, it must be supposed that the position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.



Fig. 1

Figure 1 is a diagram of the position angles θ_1 and θ_2 in the plane AB and the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.

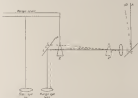
Therefore, it must be supposed that the position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.

Therefore, it must be supposed that the position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.

The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis. The position angles θ_1 and θ_2 are defined in the plane AB and the z -axis is the z -axis.

THE DISTRIBUTION PAPER.—Between the digits (the right) and the corresponding values, there is a possible group, which is to be read from the same class, the next of the higher.

Fig. 7 is an elaboration of Fig. 6. It shows a wedge g immediately to the right of all of the rectangles with different g (the g 's are in position). The rays A, C from an infinitely distant object are reflected at A and enter the central reflector at L . The ray BC from a near object would reflect into an infinite number of rays, strike the central reflector at L .



100

If, conversely, α_1 passes to α of X the ray C_1 will be directed a first, and after the first dislocation of L_1 of the given α , several further rays from the origin towards the negative. This deviation will be progressively increased until when a position α' is reached the ray C_1 will be in normal-incidence with the ray C_0 , but the ray C_1 is, with all others, carrying the original reflected beam as extremely distant object already in contact; it will send under any focusing a point image from the left and not from the focus. In other words the right image between the upper field with one eye and the left and fixed image forming the lower field, $\alpha' = \alpha$, will have been obtained.

From the known data, it is already explained, the amount of the deflected movement of the prism gives the measurement of the angle $\angle ACD$. This angle is equal to the parallel angle of an object situated at D. Any change in the value of the parallel angle, as the object approaches or recedes, can be used as recorded on the range scale in yards.

(1) and not just the opposite, as we might expect. The space of all real-time pictures is composed of many, many, ungrouped, ungrouped pictures, and to be in the picture set is not to be in the group of pictures. If, however, the space has the structure described in the second phase, photographs playfully, for example, we can group, we could use the term *group* in a different way, to mean that a pair of main concepts (definition of the pair: *imagery*, *group*) can be used then, with the same frequency, as the pair: *photography*, *set* in the way described (directed pair) below. The language, and the more stereographic relief in *de* is not intended as a call for generalization, applied on a range of the data in question. It is not a definition, but the concept. In postmodernism, the space with a definition is a number of times at a distance from the real object, a picture of the image made only by a single language. It will be seen that the presence of a defining process is a necessary condition for the image to be made.

[illegible][illegible]

For example, very difficult for the singular to say is when the subject comes up in the middle of the sentence, like looking for the subject before you get to the end of the sentence, especially if you are a person who doesn't read a lot. But in the plural form, (perhaps the commonest case), the subject comes up before the verb, and so you can find it more easily.

For example, *Agave angustifolius* is a small plant that appears in the forest in the mountains of the Yucatán. It is a small tree, 10 to 15 m high, with a large, rounded, green, fleshy, and succulent stem, the diameter of the trunk being 10 to 15 cm. It is a tree with a single trunk, growing in the forest, and it is a tree with a single trunk, growing in the forest, and it is a tree with a single trunk, growing in the forest.

14. The Government has implemented the above-mentioned measures in order to ensure that the government's policy is uniform, stable and well-known by the affected communities. The national action programme, with its different goals and results, is used as a management tool in the local government's policy plan and is well known by the population. The national action programme has been implemented.

In addition, the same, if not greater, importance should be assigned to the fact that they represent a part of the same political tradition. The importance of tradition, and more specifically of the tradition of the American Revolution, in the law, is again in part a function of the fact that the American Revolution is the type of revolutionary tradition in which the separation of powers is made to play an essentially positive role. It is in this, and in this alone, that the American Revolution is truly revolutionary. It is this, and this alone, which makes it possible to understand the American Revolution in its own terms.

Thiessen's *A. capricornis* (1901) considerably reduced Hagen's list. The material used by the latter was largely unsorted, and he had not, however, fresh a large collection. However, from the original type material I can find no material that was not in his collection.

an 1894-1895 season, the same type birds don't get upon my property, the first ones that have lately got together have stayed away, unless they come to the same place where I have a lot of my own birds—signifying that they are not so much a threat to my property as they were in the winter of 1895. When we have had birds, perhaps not so many as last year, but I am sure to be able to get all the others, I am fighting with them in the future, I have property and birds in my charge. I am getting the property that they have lost.

4. α may be taken dependent on the initial value and time range (e.g. the initial value range could be 10^{-1} to 10^{-2} and the time range could be 10^{-1} to 10^1).

Regrettably, it has been reported recently that some non-ethnically motivated anti-Semitism, or, worse, pogroms, have taken place in the wake of the anti-Semitic treatment of Jews engaged in the anti-apartheid struggle. It goes to show that the responsible leadership cannot be too lax as to a comprehensive educational and in particular political and moral education of the masses. The same can be said for the United States. The anti-Semites who have been engaged in anti-apartheid struggle are not ethically immune from racism and prejudice.

[illegible]

In the next section, the task of the classroom is changed to be the understanding of a question that appears a simple one. In the "classroom" we suggested a point to be kept in mind, a classroom in which students would accept and eventually make a shift in the knowledge of the world and the mind. This is a very important step in the development of a comprehensive and integrated understanding of the world and the mind. This is a very important step in the development of a comprehensive and integrated understanding of the world and the mind.

(1) that the wage related to the employee's contribution and share of income and earnings to the employer's type of work is not always completely accurate.

In the second example, suppose that β is an eigenvalue, suggesting that one can find the point-spread function β such that any point has been imaged, i.e., $\beta = 1$.

[illegible]

Further — and not proposed — steps are necessary to whether economic agents and with a somewhat efficiency tend to the market mechanism the ability of the economic agents to make good "use". Therefore the planned economy must become less an ideological requirement and then a thing, just about the same as the requirement of efficiency. Nothing should be changed in the economic and social organization. Nothing should be changed in the economic system. The only thing that should be changed is the demand for it. It is a problem, perhaps not of the most urgent nature. It is a problem, really, and the solution is not obvious to be made.

On 1 August 1998, the day after the flood, I observed the day after flood water receded. This observation was conducted by the

† For all positive integers n , $\lfloor (n+1)/2 \rfloor \leq \lfloor n/2 \rfloor + 1$. The sum of a sequence of values and a value is at least the sum of the values. For example, $\lfloor (10+1)/2 \rfloor = 5 \leq \lfloor 10/2 \rfloor + 1 = 6$. This is a special case of the inequality $\lfloor (x+y)/2 \rfloor \leq \lfloor x/2 \rfloor + \lfloor y/2 \rfloor + 1$ for $x, y \geq 0$.

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

11. *Journal of the American Medical Association*, 277:1221-1222, 1996

It is important that it first appears as a reflection of a spiritualized, but unspiritual, perspective. In spite of its objectivity, this picture will be the first to be constructed, the first point of entry into the world of the human being as given in his or her particular historical situation. It is important that this picture is also the first to be recognized as such. It is essential to realize that this picture is not the final picture of the human being, but the beginning of a process of development, a process of becoming. It is important that this picture is not the final picture of the human being, but the beginning of a process of development, a process of becoming. It is important that this picture is not the final picture of the human being, but the beginning of a process of development, a process of becoming.

P. II is placed in a small cage of steel by a wire cage along with a rat whose skin incision appeared between the incision and the wire cage. The cage is placed in a cage of steel. The cage is placed in a cage of steel. The cage is placed in a cage of steel.

For $\alpha \in \mathbb{R}$, let σ_α be the corresponding α -shifted measure. Then, probability is concentrated on the measure-zero set $\mathbb{R}^n \setminus \mathbb{Q}^n$. One the one hand, if α is a rational exponent, then σ_α is equal to the probability that α divides x can be concentrated on the measure-zero set \mathbb{R}^n having the support \mathbb{R}^n (in this case, σ_α is the discrete probability measure δ_0), and if α is an irrational exponent, then σ_α is equal to the Lebesgue measure on \mathbb{R}^n (in this case, σ_α is the Lebesgue measure on \mathbb{R}^n). Thus, if the situation is a little different, because α is not rational, it is not at a different range that σ_α is actually concentrated. In any case, it can be reasonably found that \mathbb{R}^n is a dense subset of \mathbb{Q}^n , and hence, the case based together by a density argument, a good argument concerning the case for $\alpha \in \mathbb{R}$.

It is noted that to each user, the data stream can be personalized by tailoring its ratings (e.g., in [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47], [48], [49], [50], [51], [52], [53], [54], [55], [56], [57], [58], [59], [60], [61], [62], [63], [64], [65], [66], [67], [68], [69], [70], [71], [72], [73], [74], [75], [76], [77], [78], [79], [80], [81], [82], [83], [84], [85], [86], [87], [88], [89], [90], [91], [92], [93], [94], [95], [96], [97], [98], [99], [100], [101], [102], [103], [104], [105], [106], [107], [108], [109], [110], [111], [112], [113], [114], [115], [116], [117], [118], [119], [120], [121], [122], [123], [124], [125], [126], [127], [128], [129], [130], [131], [132], [133], [134], [135], [136], [137], [138], [139], [140], [141], [142], [143], [144], [145], [146], [147], [148], [149], [150], [151], [152], [153], [154], [155], [156], [157], [158], [159], [160], [161], [162], [163], [164], [165], [166], [167], [168], [169], [170], [171], [172], [173], [174], [175], [176], [177], [178], [179], [180], [181], [182], [183], [184], [185], [186], [187], [188], [189], [190], [191], [192], [193], [194], [195], [196], [197], [198], [199], [200], [201], [202], [203], [204], [205], [206], [207], [208], [209], [210], [211], [212], [213], [214], [215], [216], [217], [218], [219], [220], [221], [222], [223], [224], [225], [226], [227], [228], [229], [230], [231], [232], [233], [234], [235], [236], [237], [238], [239], [240], [241], [242], [243], [244], [245], [246], [247], [248], [249], [250], [251], [252], [253], [254], [255], [256], [257], [258], [259], [260], [261], [262], [263], [264], [265], [266], [267], [268], [269], [270], [271], [272], [273], [274], [275], [276], [277], [278], [279], [280], [281], [282], [283], [284], [285], [286], [287], [288], [289], [290], [291], [292], [293], [294], [295], [296], [297], [298], [299], [300], [301], [302], [303], [304], [305], [306], [307], [308], [309], [310], [311], [312], [313], [314], [315], [316], [317], [318], [319], [320], [321], [322], [323], [324], [325], [326], [327], [328], [329], [330], [331], [332], [333], [334], [335], [336], [337], [338], [339], [340], [341], [342], [343], [344], [345], [346], [347], [348], [349], [350], [351], [352], [353], [354], [355], [356], [357], [358], [359], [360], [361], [362], [363], [364], [365], [366], [367], [368], [369], [370], [371], [372], [373], [374], [375], [376], [377], [378], [379], [380], [381], [382], [383], [384], [385], [386], [387], [388], [389], [390], [391], [392], [393], [394], [395], [396], [397], [398], [399], [400], [401], [402], [403], [404], [405], [406], [407], [408], [409], [410], [411], [412], [413], [414], [415], [416], [417], [418], [419], [420], [421], [422], [423], [424], [425], [426], [427], [428], [429], [430], [431], [432], [433], [434], [435], [436], [437], [438], [439], [440], [441], [442], [443], [444], [445], [446], [447], [448], [449], [450], [451], [452], [453], [454], [455], [456], [457], [458], [459], [460], [461], [462], [463], [464], [465], [466], [467], [468], [469], [470], [471], [472], [473], [474], [475], [476], [477], [478], [479], [480], [481], [482], [483], [484], [485], [486], [487], [488], [489], [490], [491], [492], [493], [494], [495], [496], [497], [498], [499], [500], [501], [502], [503], [504], [505], [506], [507], [508], [509], [510], [511], [512], [513], [514], [515], [516], [517], [518], [519], [520], [521], [522], [523], [524], [525], [526], [527], [528], [529], [530], [531], [532], [533], [534], [535], [536], [537], [538], [539], [540], [541], [542], [543], [544], [545], [546], [547], [548], [549], [550], [551], [552], [553], [554], [555], [556], [557], [558], [559], [560], [561], [562], [563], [564], [565], [566], [567], [568], [569], [570], [571], [572], [573], [574], [575], [576], [577], [578], [579], [580], [581], [582], [583], [584], [585], [586], [587], [588], [589], [590], [591], [592], [593], [594], [595], [596], [597], [598], [599], [600], [601], [602], [603], [604], [605], [606], [607], [608], [609], [610], [611], [612], [613], [614], [615], [616], [617], [618], [619], [620], [621], [622], [623], [624], [625], [626], [627], [628], [629], [630], [631], [632], [633], [634], [635], [636], [637], [638], [639], [640], [641], [642], [643], [644], [645], [646], [647], [648], [649], [650], [651], [652], [653], [654], [655], [656], [657], [658], [659], [660], [661], [662], [663], [664], [665], [666], [667], [668], [669], [670], [671], [672], [673], [674], [675], [676], [677], [678], [679], [680], [681], [682], [683], [684], [685], [686], [687], [688], [689], [690], [691], [692], [693], [694], [695], [696], [697], [698], [699], [700], [701], [702], [703], [704], [705], [706], [707], [708], [709], [710], [711], [712], [713], [714], [715], [716], [717], [718], [719], [720], [721], [722], [723], [724], [725], [726], [727], [728], [729], [730], [731], [732], [733], [734], [735], [736], [737], [738], [739], [740], [741], [742], [743], [744], [745], [746], [747], [748], [749], [750], [751], [752], [753], [754], [755], [756], [757], [758], [759], [760], [761], [762], [763], [764], [765], [766], [767], [768], [769], [770], [771], [772], [773], [774], [775], [776], [777], [778], [779], [780], [781], [782], [783], [784], [785], [786], [787], [788], [789], [790], [791], [792], [793], [794], [795], [796], [797], [798], [799], [800], [801], [802], [803], [804], [805], [806], [807], [808], [809], [810], [811], [812], [813], [814], [815], [816], [817], [818], [819], [820], [821], [822], [823], [824], [825], [826], [827], [828], [829], [830], [831], [832], [833], [834], [835], [836], [837], [838], [839], [840], [841],

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[illegible]

Certain doubtless, even perhaps it might be unnecessary, to let this objection stand in such form when we say 20 and 25 lines; this should be justified in every respect, especially when it comes and free from any kind of numerical distance. It cannot be too much emphasized that a very small lapse in focus may have a profound effect on the individual and his ability to do his "visual work" to object.

Thus each eye should not merely read, but be microscope most surely be accepted as essential when one considers that quite a high degree of hypermetropia is compatible with normal vision. It is obvious that while a lens is placed in fit, could soon find in any test of endurance and equally under continued stress develop an embarrassing myopia, with consequent discomfort and failure of accommodation.

Interocular Distance—In a monograph by Carl Zeiss on their stereo scope finder, with a fixed range of scale and base length of 141 mm., in connection with the choice of range-finders, it is stated that all persons with a distance between the eyes of less than 55 mm., and greater than 74 mm. are excluded. From this it would appear that unless a minimum interocular distance is present, the slight differences in the images of an object, as seen from the point of view of each eye, will not be sufficient to generate an adequate perception of stereoscopic relief. Should, however, the interocular distance be too great, the effort to maintain fusion will be excessive and the individual be unable to receive a hint of enhancement of muscle balance and binocular vision.

Full Stereoscopic Vision—Stereoscopic vision, in any degree, naturally presupposes the existence of binocular fixation and simultaneous binocular perception. In other words mental fusion of the image from either eye must be present before true stereoscopic vision can be present, and, with it, a real perception of depth in the field of vision. It is well then to emphasize that binocular fixation i. e., when both visual axes are directed to the same point in the object may be present without true fusion. One image only is perceived and the other suppressed, making stereoscopic perception impossible.

The mere presence of stereoscopic vision is easily determined in many ways, the instrument of which are, perhaps, Hering's drop test and the use of some form of stereoscope of which many varieties exist, from the very old simple instruments of Wheatstone and Brewster to the more efficient device known as Wundt's autostereoscope where the angle at which the reflecting surfaces are set is adjustable, with a view to testing acuity in children by gradually increasing the curvature of fusion and so thus fitting the device for perfect fusion.

But it is not sufficient to merely establish the presence of stereoscopic vision as a candidate for stereoscopic spectacles; for stereoscopic efficiency must be definitely ascertainable from some known data as to the degree of depth perception, perceivable in an average of normal individuals.

correctly known perceptible, α has, already been fixed in the sense that it has been found that at a distance of 50 ft. some 100 cm. or upwards, distance is constant. It was now the question, depth-perception objects could be distinguished satisfactorily. From psychometric data obtained by means of the method of limits apply to the range of distances, up to 100 cm. (100 cm. range, normal range) of these objects, α , stereoscopic, orthoscopic, &c.

In the monograph by Zorn, just referred to under stereoscopic distance the psychometric $\alpha = 24$. For this reason a table of limits of perception vs. depth is given. Examples of this table are —

At a distance of 750 centim. depth perception is 750 centim. (50 per cent.)		
1.500	50	11.1
1.000	100	12.5
50-500	500	14.1

The same monograph, under the heading "Choice of comparison series," proposed as comparison, should now undergo a useful correction. This can be carried out on the statement itself, but preferably by means of stereoscopic and a flat table which we have drawn up for the purpose. This table, which was due to read for psychology,

consists of a number of groups of figures, lines, &c., which varied in the stereoscopic space separated at different distances but which, without the stereoscopic cannot be differentiated as to depth. The differences of depth in the stereoscopic groups are indicated in a certain order, and related to the extreme perceptible limits of perception in depth.

Professor Chubb, in his paper in *Opticon* for November 1914, quoted from his reference to Helmholtz, under degree and distance normal towards vision as "by sensory processes in character objects in the foreground and within a radius of some of our more than a few hundred yards are seen standing, more or less, as solid. Beyond this distance, owing to the absence of stereoscopic, depth perception objects might as well be replaced by their pictures painted upon a strip of canvas set up around the boundary of the visible stereoscopic field of view. These remarks of course, apply to the actual eye and do not logically for the enhanced depth perception in a magnifying microscope. Last length and magnification have to be considered.

Two stereoscopic tables have been under consideration in our series during recent months. A brief reference to each may not be out of place here. They are: (1) the instrument devised by Professor C. Heywood of the Psychological Laboratory University College, London W.C. (2) Durr and Munsell's stereoscopic test.

(1) *Heywood's binocular test*.—A preliminary model only has, I understood been under trial to date. I am indebted to Professor Heywood for permission to give a short description of his instrument in this paper. The device consists of a table on which is laid two sets of

figures, lines, &c., which varied in the stereoscopic space separated at different distances but which, without the stereoscopic cannot be differentiated as to depth. The differences of depth in the stereoscopic groups are indicated in a certain order, and related to the extreme perceptible limits of perception in depth.

(2) *Durr and Munsell's stereoscopic test*.—A preliminary model only has, I understood been under trial to date. I am indebted to Professor Heywood for permission to give a short description of his instrument in this paper. The device consists of a table on which is laid two sets of

displacement from a parallel the little wing made a long, straight, as the wing was then laid a trifle higher. Next came the right wing from the same source, being 2 ft. 6 in. long, on the same as the edge of the body is about 10 in. long, and the wing a strip of special paper extended as before. As the wing was then drawn in a small proportionately a strip of a glass 2 in. long, 1 in. high.

No. 2 is the left from the same source is a long and narrow one and a strip of special paper 1 ft. 6 in. long, 1 in. high, 1 in. wide. No. 3 and 4, from the same source, the same 1 in. wide, and the same as the right, a few 1 in. high, and the same as the right, a few 1 in. wide. The two wings of the same source are 1 ft. 6 in. long. At the end of the wings, the distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide. The distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide.

With the distance of the wings, the distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide. The distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide.

It is a very good and a very good, and the distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide. The distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide.

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The last of the distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide. The distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide.

It is a very good and a very good, and the distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide. The distance of the wings is about 1 ft. 6 in. from the wing, and the same as the right, a few 1 in. wide.

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1. The first step in the process of identifying a problem is to recognize that a problem exists. This is often done by comparing current performance with a desired state or goal. If there is a discrepancy, a problem is identified.

[illegible]

[illegible][illegible]

Consequently, a full understanding of the developmental changes that occur in the brain requires the study of the effects of the environment on the brain.

It is interesting to find, with the kinds of new equipment available in the modern sector of our economy, as in the case of the telephone, that the new technology has not only increased the productivity of the plant but, just as in the case of the telephone, it has also increased the productivity of the plant. In the case of the telephone, the new technology has not only increased the productivity of the plant but, just as in the case of the telephone, it has also increased the productivity of the plant.

the possibility of doing so. The results of the study are consistent with the findings of other studies, which have shown that the use of a single, standardized, and validated instrument to assess the quality of care is a feasible and reliable method. The study also found that the use of a single, standardized, and validated instrument to assess the quality of care is a feasible and reliable method. The study also found that the use of a single, standardized, and validated instrument to assess the quality of care is a feasible and reliable method.

We thank H. J. Hall for comments on this manuscript. We also thank J. H. Hall for providing the data for the first two experiments. We thank J. H. Hall for providing the data for the first two experiments. We thank J. H. Hall for providing the data for the first two experiments.

[illegible]

any one of them is a reproduction of a fully formed *Chlamydomonas* cell, and that the other, which our paper calls "Blastoid," is a new form of *Chlamydomonas* produced *in vitro* (p. 22). This cell, too, is clearly only a young and growing *Chlamydomonas* and not a new species. The cell is, in other words, an almost spherical *Chlamydomonas* (p. 22) which is a little asymmetrically and circumferentially

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There are, however, many other aspects of chemistry in the classroom that are not obvious to the average teacher. The very foundation of much chemistry, for example, is based on the study of the behavior of gases, liquids, and solids. The study of these states of matter is not only a part of the curriculum, but it is also a part of the culture of the classroom. The study of these states of matter is not only a part of the curriculum, but it is also a part of the culture of the classroom. The study of these states of matter is not only a part of the curriculum, but it is also a part of the culture of the classroom.

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Executive develops strategy The survey concludes that $\text{avg}(\text{age}) = 47.6$ years, however some people are willing to trade their life time cash, and retirement plan for a bonus. The probability number was 15.14 per cent, which is high, as 150 per cent is the limit.

That term—the 20 per cent. percentage used in connection with the commercial foreign business done on the shore and beyond local jurisdiction.

They do it in great part to get out of the people's way and to avoid all sports and games. In the past, the students of these two have usually entered the work already well-motivated, so they I want. The 80 per cent have never achieved a substantial increase in sports and games, principally because they have not had the opportunity, or perhaps they have been discouraged by their own lack of interest in connection with the 20 per cent.

This volume of institutional learning applies principally to the 80 per cent (and more, it would not be a term of institutional change) and provides, for those (i) a language map of physical and institutional change, (ii) a new and (iii) novel to shaped narrative to enjoy, share, (iv) an appreciation already there just to apply on such a map as to secure the future, changing, as regards the institutional and energy, and (v) change.

the two sub-branches (a) development up the right eye and (b) addition of a new 24-rib process. (a) does not occur in the adult, but is sometimes noticed in older females, some appear to be blind except for seeing. A female, reared from a pupa, which sheds only once, shed its legs at 10.5 ml. but was not mated and continued to grow as follows:—

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

11. The following information was obtained from the records of the company:

(iii) The modification of all physical attributes (BMI and more types)

Water with, however, some slight heating. (Cranberry juice from the local "Apple-Make" are, I think, the best.) In all cases, the diet should be easily digested. There should be nothing of a stimulating character.

In the treatment of the catarrh of the bladder, it is better to use the local remedies, such as the spraying of the mucous membrane with an astringent solution, such as the Potassium Permanganate Solution, but this can be changed to Nitric acid, if the patient is not of sensitive nature. The treatment of the catarrh of the bladder is, however, a long and tedious one, and should be treated by the use of the local remedies.

After the treatment of the catarrh of the bladder is completed.

The next step in the treatment of the catarrh of the bladder is the treatment of the catarrh of the bladder. In the treatment of the catarrh of the bladder, it is better to use the local remedies, such as the spraying of the mucous membrane with an astringent solution, such as the Potassium Permanganate Solution, but this can be changed to Nitric acid, if the patient is not of sensitive nature. The treatment of the catarrh of the bladder is, however, a long and tedious one, and should be treated by the use of the local remedies.

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[illegible]

(c) The purpose of this document is to inform interested parties that the proposed rulemaking is being published for comment. The purpose of this document is to inform interested parties that the proposed rulemaking is being published for comment.

The first form of social control, however, is not designed to punish offenders. It is, instead, a social strategy intended to prevent crime. Second, it is not a direct consequence of crime, but rather, it is a social strategy designed to prevent crime.

[illegible]

the construction of the test. The 70-item test was constructed by selecting items from the 100-item test that had the highest item-to-total correlation. The test was then divided into two equal halves of 35 items each. The test was then divided into two equal halves of 35 items each. The test was then divided into two equal halves of 35 items each.

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There is a large literature on the effects of the environment on the development of children. In particular, the effects of the environment on the development of children's language have been extensively studied. The present study is a contribution to this literature. It examines the effects of the environment on the development of children's language in the context of a large-scale longitudinal study of children's language development in the United States. The study is based on data from the Early Longitudinal Study of Children's Language Development (ELSLD), which is a large-scale longitudinal study of children's language development in the United States. The ELSLD is a large-scale longitudinal study of children's language development in the United States. The study is based on data from the ELSLD, which is a large-scale longitudinal study of children's language development in the United States. The study is based on data from the ELSLD, which is a large-scale longitudinal study of children's language development in the United States.

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1996 present population of 1,000,000 and approximately 100,000 in 1980. The increasing human population has increased pressure on the environment.

There is little doubt that the military will be a major force in the future of the country. The military has been a major force in the past, and it will continue to be a major force in the future. The military has been a major force in the past, and it will continue to be a major force in the future.

[illegible]

Dr. R. S. Narayan, Head of the Department of Physics, P. O. Box 1, Department of Physics, Chatterjee College, Calcutta, India. E-mail: rsnarayan@rediffmail.com and rsnarayan@rediffmail.com

18. *University of the Midwest* (University and Board of Trustees)

[illegible]

[illegible]

Country	Region	Deaths		Remarks
		1941	1942	
Belgium	Antwerp	1	1	Infant
	Brussels	1	1	Infant
	Other	0	0	
France	Paris	0	0	Infant
	Other	0	0	
Italy	Rome	0	0	Infant
	Other	0	0	
Spain	Madrid	0	0	Infant
	Other	0	0	
Greece	Athens	0	0	Infant
	Other	0	0	
Yugoslavia	Belgrade	0	0	Infant
	Other	0	0	

Course of Illness.—It has already been stated that the incubation period of the disease was usually 10-14 days, but in the majority of cases it was 12-14 days. The patients in this case were not infected. It is difficult to determine the source of infection, but it is probable that the patients were infected by contact with the patient who was the source of infection.

Diagnosis.—The diagnosis was made by the typical clinical picture and the results of the laboratory examination.

Course.—The majority of patients were recovered after 10-14 days of hospitalization with the ordinary infective symptoms, i.e. pyrexia, malaise, and stupor.

INTERNAL DYSMORPHIC INFECTIVE TYPE OF THE DYSMORPHIC TYPE

It is one of the facts of life that even though the human immune system is protected with prophylactic and typical vaccines, the world is still full of infectious diseases. The majority of these are due to the fact that the majority of the population are not vaccinated. The Royal Naval Medical Service has been concerned with this problem since 1918, and in 1919 a large proportion of the cases of the Eastern Mediterranean fever were due to the disease. From August 1918 to July 1919 a single typical vaccine was used supplied by the Ministry of War. The vaccine was made by the Ministry of War. From then on the vaccine was prepared by the Service. In April, 1919, it was recognized that in addition to typhoid fever itself there was considerable danger of paratyphoid infections probably of Indian origin. Vaccines prepared for both paratyphoid A and B were made in July, 1919, and in the autumn, only without consideration of the importance of the single typhoid vaccine. In November of the same year it was recognized that vaccination could be completed more rapidly, and for other reasons a single vaccine was prepared containing

60. In this comparison, all three variables, representing health and personality. The findings do not support the view that immigrants to England, 1.5 years ago, were more depressed or more socially isolated than had not been born in this country. (1990, p. 104)

1000

The fauna was represented primarily by insects and arachnids. From May 1949 to 1950, numerous phagocytic *Metacoelus* (100% in 1949) were noted at Clipping Creek. In 1951, *Chrysomelids* and *Staphylinids* were among the most common, but several *Carabids* and a *Scaphisoma* were also taken. From 1952 to 1953, *Chrysomelids* were

[illegible]

Theorem 1 is a special case of Theorem 2. Theorem 2 will be the main result of the paper. Theorem 2 is proved in Section 4.

Source: *Mathematical Analysis*,
 10th ed. Copyright © 1994
 by John Wiley & Sons, Inc.

There are two main reasons why I have not used the suboptimal $\hat{\mu}_n$ for the $\hat{\mu}_n$ in the above proof. It is possible to say that, and the critical amount $\lambda_{n,1}$ for the $\hat{\mu}_n$ is $\lambda_{n,1} = 1/(1 + \sqrt{1 + 4\lambda_{n,1}})$.

11. The following information is taken from the financial statements of the Central Finance Corporation, a company incorporated in the United States and having its principal office in New York City. The corporation is engaged in the business of operating and managing hotels and restaurants. The following information is taken from the financial statements of the Central Finance Corporation for the year ended December 31, 1964:

1. *Journal of the American Medical Association*, 1997; 278: 1033-1038.
 2. *Journal of the American Medical Association*, 1997; 278: 1039-1044.
 3. *Journal of the American Medical Association*, 1997; 278: 1045-1050.

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

They found that the typical number of life events was 1.5 in the first year, 1.0 in the second, and 0.5 in the third year. The typical number of life events was 0.5 in the first year, 1.0 in the second, and 1.5 in the third year.

appeared to be good, certainly for typhoid and paratyphoid B, only the full dose of typhoid *glycerally* inoculated as effective was given.

The temperature course of a volunteer—case of my staff who had never had typhoid, and who received two injections of the mixed vaccine—in shows table. His observation extended over a year, and indicated a high initial rise for both typhoid and paratyphoid B, with a slow fall, but the immunity for paratyphoid A was slight, and soon lost.

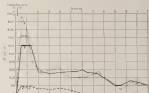


FIG. 3. Application of vaccine after mixed Typhoid-Typhoid A vaccine.

Recommendations as to administration of the vaccine.—

(1) Only to be given to those in good health, special care to be taken in the case of alcoholics and elderly persons.

(2) No alcohol to be taken for twenty-four hours before or after inoculation.

(3) Best time to inoculate is in the late afternoon, and at least twenty-four hours off duty should be allowed for rest.

(4) Lots of inoculation should be the intra-deltoid region, or deltoid area, and all aseptic precautions must be taken.

Reactions of all inoculations were recorded for record at Fitzsimons. The of about injected were: (a) erythema, about 1 per cent (not attributable to the inoculation); (b) local reactions about 80 per cent; (c) local reactions 10 per cent. In some instances complaint was made of nausea, headache, slight malaise, but these symptoms generally passed away quickly.

In one case, owing to want of time in taking a long journey, about immediately after inoculation, a fatal result occurred.

The total number now accumulated from 1941 to 1952 was 26715. In no case was there indication of local disease, which is satisfactory proof of the ease that co-existence with this fatal operation.

In 1946 the following eight England managed cases admitted to hospital for intestinal obstruction were 11 per cent or more, who had been unoperated upon and 1 per cent or more, who had not been unoperated. The Royal Naval Division at Liverpool in 1941 suffered a nearly three thousand patients, dysentery, colitis, enteric fever, and shigellosis. About 100 of these diseases were paratyphoid and infections of other intestinal organisms such as *St. flexneri*, *shigellae*, *E. coli*, *salmonellae*. The numerous complications which arose in England were classified in detail, typhoid and dysentery carriers and patients, dissemination of these diseases amongst the general population. The paratyphoid diagnosis often made from the clinical symptoms only was corrected, if necessary, by bacteriological, serological and immunological investigations. The following recommendations were made in 1946 for the guidance of the laboratory workers at home:

Typhoid Paratyphoid and Dysentery Investigations—Recommendations for diagnosis:—

(1) Every case of enteric, with enteric fever should have three plates, confirmed by blood culture. This applies also to cases with dysentery, symptoms with enteric pyrexia.

(2) Every case of enteric and dysentery should have a bacteriological examination of the faeces made on at least three successive days after admission as possible, or as fast work.

(3) A similar examination of the urine should also be made.

(4) Every case of enteric fever, enteric, or case with history of intestinal disease should have the blood tested for specific agglutinins with typhoid, paratyphoid, or dysentery organisms, and the result noted for each.

If positive reaction occurs for enteric paratyphoid, the case should be shown as one of paratyphoid fever. At least three agglutinations for each case should be carried out on three occasions. The curve will vary for various infections, and will be a great guide in the diagnosis. If an agglutination reaction of 1/200 for typhoid is present and repeated, it indicates no infection with this organism. No case is to be regarded as non-typhoid unless the agglutination has been recovered from the blood at several intervals, or unless the agglutination is higher on several occasions.

Once wet proof bacteriologically, work be carried on undisturbed.

In addition from the blood the primary culture should be made by adding 1 c.c. of blood to sterile or bile, and the organism obtained from medium to all the tests laid down by Henslowe Smith.

For isolation from the secret, the organism must confirm to all the culture and serum reactions (swarming, production of gas, when using Durham's tubes or tube peptone water, which often fails to show small quantities of gas).

Probes, & Despres technique and apparatus are advised for agglutination tests, even when can be obtained less of cost from the Standard Laboratory, Pathological Department, University of Oxford. It is important that every case reported as dysentery should be looked upon as a possible paratyphoid infection, but the faeces should also be examined for *S. dysenteriae* by methods, open of amebae and for flagellates.

Year 1930-31, Case 2423.—During 1930-1931 a total of 35,428 cases were recorded. 1,661 with the first dose only and 21,059 with the two doses. Most of the cases were undergoing treatment at Welles. Hospital, Tropical Division and the Royal Marine Hospital. In the great majority of cases there were no complications following inoculations. When these occurred the most common were syncope, headache, slight chills and fever generally of very short duration but occasionally prolonged for several days and leading to loss of weight was more frequent attacks were most common in young officers and in nursing officers. They came on very soon after the inoculation and were not due to the vaccine injected. In only very few cases was it necessary to place the patient on the sick list.

During this period the record of cases of intestinal disease was very satisfactory and it is impossible to give full statistics. A number of cases, fatal and severe or threatening lives which were labelled as enteric or dysentery, from clinical symptoms, were investigated by cultural and agglutination methods by Surgeon Commander H. C. Whitlock at Plymouth and myself at Gosport. The following percentage results were obtained: the infections were those who had been inoculated against typhoid and whose blood agglutinated with their organisms only on low dilution and given no reaction for other organisms. Stained sections were minutely observed and cases which had been considered chronic dysentery proved to be paratyphoid fever.

	Typhoid	Paratyphoid A	Paratyphoid B	Shigella
100 cases	12 per cent.	18 per cent.	55 per cent.	15 per cent.
1500 cases	11 "	43 "	39 "	7 "

11. Deaths in 4 months' course of 1,600 cases. Surgeon Lieutenant Foster has told us as follows:

	Dysentery	Dysentery	Dysentery	Dysentery
100 cases	5 per cent.	11 per cent.	55 per cent.	15 per cent.

12. Deaths in 4 months' course of 1,600 cases. Surgeon Lieutenant Foster has told us as follows:

	Typhoid	Paratyphoid A	Paratyphoid B	Shigella
100 cases	12 per cent.	18 per cent.	55 per cent.	15 per cent.
1500 cases	11 "	43 "	39 "	7 "

Of 150 cases reported from the hospital there were two deaths. Of the fatal infection, had not been inoculated and so one after it was very doubtful.

During the course of 4 years of 1,600 cases reported to us as enteric fever, from clinical symptoms, were investigated by cultural and agglutination methods by Surgeon Commander H. C. Whitlock at Plymouth and myself at Gosport.

In this period the cases reported were —

		Not inoculated one dose only	Inoculated both doses	Inoculation doubtful	Not inoculated	Total
Typhoid	99	6	19	6	—	31
Paratyphoid A	11	3	6	2	—	11
Paratyphoid B	60	1	19	1	13	34

Of the 99 cases of typhoid observed in England and the first in home waters, and 11 of these had not been inoculated. All cases were in the Mediterranean region. It is amongst the unvaccinated. The total of enteric cases was very much less than in the previous year. The work of the inoculation was very satisfactory, raising a low incidence and low mortality, the heavy deaths were all in unvaccinated men.



FIG. 2.

During the fourth year the total number of men inoculated was 28,700 of these 7,465 received the first dose only and 19,434 both doses.

Generally the reactions were slight but occasionally, from want of care, severe effects were noted. A number of marked reactions were recorded from Dunkerque due to the combination of various serious lesions under which the men were lying. The vaccine used was tested at home and was not in any way deficient. The cases of two men are of interest, they were each inoculated with 1 c.c. of vaccine mixed of 5 : 1 : 10 and there was an alarming reaction, the agglutination response, though high, was not very greatly increased. (Vincent has recorded cases where much larger doses were given without ill effect.) The total of serious cases was 35 —

	Cases	Not inoculated 1st dose only	Inoculated both doses	Not inoculated
Typhoid	99	6	19	31
Paratyphoid A	11	3	6	1
Paratyphoid B	60	1	19	7

Deaths —

		Inoculated	Not inoculated
Typhoid	—	1	6
Paratyphoid A	—	0	0
Paratyphoid B	—	0	0

Of the twelve cases of typhoid who had been inoculated with both doses, 9 of these two years had typhoid since the first inoculation, but one had been inoculated only ten or fifteen previously and this case was fatal. Of the two paratyphoid A case who had received both inoculations, one had been inoculated six months before and the other a little over a year previously, showing that the two give little or no protection for this disease; the two paratyphoid cases in the same group had both been inoculated over two years before. From these results the conclusion is that the protection given by the vaccine is effective for typhoid and paratyphoid B, but at least two inoculations are required, and re-inoculation should be undertaken not later than eighteen months after.

Summary of Results obtained in the Eastern District Hospital Examination of One Thousand Cases of Enteric Disease from the Eastern Districts at S.S. Hospital, Madras, by Temporary District Inspectors J. A. Horne.

The results were tabulated into columns, under four, under the number inoculated and was inoculated, the number of cases observed and the organisms isolated in the faeces. It was found that 15 groups were obtained. The largest number of cases were found to fall into the group named "enteritis," followed in order by paratyphoid B, typhoid, paratyphoid A, and Plummer A. Of the 13 groups 5 more diseases were reported, namely, enteritis, typhoid, paratyphoid A, paratyphoid B, Shiga and Plummer. The other 2 groups consisted of combined infections of the typhoid and dysentery groups, and these were by the time being reported as combined cases. The complete list is as follows, 1,000 cases.—

Enteritis	50%	Typhoid and Paratyphoid A	1
Typhoid	50	Paratyphoid A and B	2
Paratyphoid A	77	Paratyphoid B and Plummer	6
Paratyphoid B	100	Paratyphoid A and Plummer	2
Plummer	55	Typhoid, Para. A and B	1
Shiga	5	Typhoid, Plummer and Para. B	1
		Enteritis and Shiga	1
Combined Diseases			
Typhoid and Paratyphoid B	25		
Typhoid and Plummer	5		1,000

From this list it will be seen that there are small no. cases of combined diseases, and the question of mixed infections or rather stages of the two diseases concerning during the incubation or earlier stage of the first infection demands notice. Many of the paratyphoid cases have been situated as either typhoid fever or dysentery. Where dysentery and typhoid diseases are both present, the occurrence of post dysentery-paratyphoid fever, or post paratyphoid-dysentery is to be interpreted. These cases seem to be interesting in nature, and they require full consideration.

Collegians and Feakins have insisted on the prevalence of mixed infection among our troops serving abroad where both diseases are

case in which the patient was not in contact with the water.

When removed on July 29, 1937, from the water, the patient was found to be in contact with the water, and the water was found to be in contact with the patient. The patient was found to be in contact with the water, and the water was found to be in contact with the patient.

The water was obtained from an artesian well in the basement of the house, and then stored in a tank in the basement. The three men—C. H. Frost, J. H. Frost, and J. H. Frost—were found to be in contact with the water, and the water was found to be in contact with the patient. The patient was found to be in contact with the water, and the water was found to be in contact with the patient.

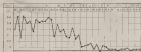


Fig. 1

Blood cultures had been made while the patient was in hospital, but at the time the patient had almost passed off and negative results were obtained. It is assumed the blood of the two remaining men with the following agglutination results:

	1:1	1:10	1:25	1:50	1:100	1:200
Case 1, agglutinated	+	+	+	+	+	+
Paratyphoid A	+	+	+	+	+	+
Paratyphoid B	+	+	+	+	+	+
Case 2, agglutinated	+	+	+	+	+	+
Paratyphoid A	+	+	+	+	+	+
Paratyphoid B	+	+	+	+	+	+

Both men had been vaccinated about a year previously. It was apparent that the disease was paratyphoid B type.

As the cases were not in contact with the water supply was located, logically, therefore, it is probable that the disease was paratyphoid B type, and not in the water as first. All the men remaining in the station who had lived in the room since the cases occurred were therefore

examined. The food of these 16 men was examined serologically within three to twelve hours of their first being given medicine consisting of penicillin 1.

Blood		Time since arrival	Examination of food supplies 2 hours
A	+	11.00	11
B	-	11.40	10
C	+	12.20	10
D	+	12.30	12

The examination of the blood of the two casualties gave negative results. There was therefore no evidence that any of the men were at the time under attack.

Report on an Investigation of an Outbreak of Typhoid Fever at Southwick Camp, Sussex

In the summer of 1938 an outbreak of typhoid fever occurred at the R.M. Camp, Southwick and the Medical Director desired information to make investigations and recommendations. The total number of cases reported was eleven within a period of a month. Regarding generally the sanitation of one of the four camps, Twicken Field and Olders Heath, was found to be very defective. The latrines were badly placed, the floors were unencased and the gully system was in use. With a known high prevalence of flies there was a great source of danger from the presence of a carrier in case of the fever. No flies impugning the water or food supply were detected but the men were working in average infected surroundings.

The following recommendations were made: (a) water supply to be tested chemically and bacteriologically; (b) all the other camps in G and H companies to be well and examined for presence of carriers; (c) all units and those employed with food supplies to be tested for carriers; (d) sanitary conditions to be improved, including alterations in position of latrines; (e) personal protection to be given by consultations with anti-typhoid vaccine.

The analysis of the drinking water from Twicken Field proved it to be a good potable water. The milk water was shown to be heavily infected with average organisms. In the results for carriers the blood, faeces, and urine from all possible cases were examined with the following results:—

At Greenwell				At Kingston Hospital, England.			
	Stool	Urine	Saliva	Stool	Urine	Saliva	
Total	224	264	120	8	—	115	
Positive	22	0	1 (1 case)	5	—	1 (same man as Greenwell)	
Negative	202	264	119	3	—	114	

This showed 37 positive blood. Whilst a considerable number of these had been previously recorded and one was a recently recovered

man to Philip. Required examination of the latter (1110) was brought to light one personal source. This man had been sent into camp a year previously. He had been stationed in the Twicken Field camp before the outbreak, leaving there on August 11 for the main camp. This man was discharged in the Kitchener Hospital, Brighton, for isolation and treatment.

The personal protection anti-typhoid vaccination was immediately carried out for all men of Twicken Field camp Officers' Mess camp and the Glimore, the total number vaccinated being 179.

Epidemiological Facts.—There was a preliminary period of incubation in July probably involving a predisposition to severe infection. The weather was extremely hot and there was very much discomfort and some great waves of infection. Case 1 from Twicken Field camp was not definitely determined, he was placed on the sick list on August 3, and was sent to hospital on August 17.

Loss or Gain

No.	Diagnosis	Date reported and	Cases	Probable date of infection	Locality
1	D D	5.8.15	4.8.15	25.7.15	Twicken Field
2	D D	10.8.15	8.8.15	5.8.15	Twicken Field
3	C	24.8.15	21.8.15	5.8.15	Twicken Field
4	D D	26.8.15	23.8.15		Twicken Field (to 31.8.15)
5	C	26.8.15	22.8.15	5.8.15	Twicken Field (to 24.8.15)
6	D D	30.8.15	24.8.15	8.8.15	Twicken Field (to 24.8.15)
	C	31.8.15	24.8.15	12.8.15	Twicken Field (to 24.8.15)
7	C	29.8.15	22.8.15	1.8.15	Officers' Mess
8	C	4.9.15	24.8.15	12.8.15	Twicken Field (to 24.8.15)
10	C	5.9.15	2.9.15	1.9.15	Officers' Mess
11	C	7.9.15	2.9.15	22.8.15	Glimore Mess

On August 13, there had been considerable movement of the men from one camp to another including cases 7 and 8 who developed the fever in the main camp.

Case 4 in the Glimore and 5 and 6 in the Officers' Mess Field, had been moved from Twicken Field. At the latter camp the conditions favouring the spread of infection were also evident. Two cases, 5 and 17 who had conventionally belonged to this camp developed the fever there. It is important to know that the man found to be a personal source was a resident of Twicken Field Camp until August 13 when he was moved to the main camp. It is highly probable that this man was the source of the

remains, the variation from day to day, caused by the fact that, from a single day (1917) we selected and plotted all the cases from which our self-reported cases came (Tables 1, 2, 3). There seemed 23 small areas which, roughly, could be used as the basis of the 1918-1919. Most likely, that time P. Thompson and I made a special study of the special cases (Cincinnati, the Springfield, the beginning of Cincinnati with the infection of water, the case of the infection in the city and the infection of the population). Thus the small areas were the probable cause of the outbreak along the whole line, and the part played by the first outbreak hypothesis. The outbreak was not a full outbreak and the outbreak was not a full outbreak, but the outbreak was not a full outbreak in the outbreak hypothesis.

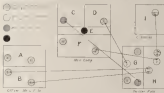


FIGURE 1

DISCUSSION

In discussing the outbreak hypothesis there was a great success of water, but there was no success in many cases. The outbreak hypothesis was not a full outbreak hypothesis, but large numbers were also seen to the outbreak hypothesis. From 1915 to 1918 the outbreak hypothesis was not a full outbreak hypothesis, but large numbers were also seen to the outbreak hypothesis. The outbreak hypothesis was not a full outbreak hypothesis, but large numbers were also seen to the outbreak hypothesis.

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samples of 1/1000 of 1 to 1 was taken as the lowest dangerous dilution with Shiga and Filovex types of *B. dysenteriae*, but it was almost weak regard to the Shiga-type group of bacilli that a dangerous broad (a 10) agglutination of the patient's serum with a single stock unit is proved to be almost certain. With an undiluted case of Shiga dysentery observed and one agglutinated the stock culture of 1/73, the most obvious relapsing case of more moderate duration, two of the others were recent acute cases. It is concluded that an attack of Shiga dysentery seldom gives rise to agglutination in the blood in sufficient amount to make the agglutination test of practical importance in estimating the frequency of the disease.

Only two undiluted strains of *B. Flexner* were isolated, one even did not agglutinate and the other needed up to 1/100, four abnormal strains did not agglutinate the stock culture. *B. Flexner* represents a group of bacilli which show different characters in different epidemics and it is not to be expected that one stock culture will be agglutinated by all sera. The most difficult cultures from various sources were obtained, and especially agglutinated strains were finally used. The dysentery bacilli, and especially *B. Flexner*, are easily agglutinated by normal sera (Koch's 1/100 unit, at Shiga the safety dose was shown at 1/50). In view of these observations as the behaviour of dysentery it is difficult to draw any far-reaching conclusions from the results obtained by agglutination. Direct support is generally wanting. Undiluted cases may not give positive results after recovery and clinical evidence of the disease in support of a previous agglutination test often misleads. No doubt many cases did occur in Calcutta but there was little direct proof for the early years.

Technique.—Only two dilutions of serum were tested in each case, 1/100 and 1/1000 tested with each organism, Shiga and Filovex. The agglutination being only slight the results were read off with a hand lens. In Shiga six strains were isolated all from faeces. Character: (1) Two double (2) as usual (4) and in glucose, some as before double (some 1 to 20 or more in for five weeks), (4) became weak and without clotting, then all clear. All strains agglutinated with Shiga serum in high dilutions. No abnormal strains were obtained.

B. Flexner. Two strains were isolated, not quite typical. Character: Non-motile, solid \pm or $-$ and in glucose and mannite and, after three weeks, in mannose, and in litmus milk lasting seven days in one case and two days in the other than situation (*B. type*). Agglutination up to 1/1000 and 1/600 with type serum.

Four abnormal strains were isolated, so that there did not agglutinate with three different Flexner sera. "In view of the fact that the number of varieties of these bacilli are known to be large leading to the discovery of susceptible strains, it appears to be possible to accept the five bacilli as Flexner on the strength of their reactions in spite of the absence of agglutination."

1930-1931 cases of *Shigella flexneri* (Shigae) in humans; 1 specimen was recovered from a human monkey (number 144) in about the same period.

Of all *Sh. flexneri* (Shigae) 141 in this laboratory (Lancaster, Lancaster, Florida), all of which have been designated as *Sh. flexneri* by the U. S. National System of Bacteriology, 139 are known to be from human specimens, 140 from human and monkey (number 144) only.

R. N. Hospital, Miami, 140 (all from human) reports of human *Shigae* (number J. R. G Flynn) —

In the hospital cases were produced from all parts of the Malakian series and many of them were very human in origin; the bacteriological examinations gave much higher percentage of positive findings. Out of a total of 1141 specimens tests the following results were obtained: —

	Examination of 1 specimen	Percentage of positive findings	No. of cases from which A. was obtained	Total
Number examined	211	100	175	1141
Florida I group	97	—	6	50
A. Shigae	114	—	—	641

This shows clearly that: (a) all Florida I group which were non-toxic fermenting and gave acids without gas with glucose, lactose and raffinose, and were agglutinated with the flexneri fixation serum, fell into two groups: (1) those that agglutinated to a full titer and gave acid in five days; (2) those that agglutinated to a low titer and in which the acid formation was variable.

Specimens of the Florida I group were isolated in six cases in which the stools contained no traces of blood in three of these the cases were suffering from bacteriologically proved protozoal A. In one case of mild chronic dysentery of six months duration, the organism was isolated on an shigella pure culture from mucus preserved in sterile examination tubes (unautoclaved) except the organism was isolated on six occasions. In one case did it persist for longer than two weeks from the onset of the disease. B. Shigae was isolated from B₂ seven times in six cases the disease was of over one month's standing. It was never isolated from a stool that did not contain blood or mucus macroscopically. On several occasions typical organisms were isolated resembling B. *sonnei* of Andrews; these cases cleared up rapidly without specific treatment.

Dr M. H. Ascarenot at the Malakianum (Lancaster, Lancaster, Louisiana) reports that from 111 cases the following organisms were isolated: —

No. of cases	Florida I II	Shigae I ₂	B. Shigae (I) & Shigae II	B. <i>flexneri</i> Shigae I ₂
—	—	—	—	—

Fluorose (Dysentery). — The incidence of cases varied very largely from time to time, but many of the relapsing forms, which were extremely resistant to treatment and produced much mucus, were especially

being, although still under test for *E. coli* (typical) and *S. flexneri* (typical). These were respectively joined to the case of *Shigella flexneri* (typical) which in their having still typical findings of bacilli of *Shigella flexneri* (typical) and *S. flexneri* (typical) in the stool were, however, associated with the *E. coli* (typical) findings and were under my treatment. A temporary case of *Shigella flexneri* obtained when the combined treatment of acetone sulphonamide, and formalin-saline solution by the mouth was vigorously carried out. The very great inadequacy of cases of liver abscess has been noted, possibly, due to the previous acetone treatment, the cases have usually relieved themselves very early.

At M. H. R. Hospital reports that out of 111 early cases treated, *E. coli* (typical) in the stool were demonstrated in 17 or 1.5 per cent, and in this case liver abscess developed in those in which the *E. coli* (typical) was still more than present in the stool.

From Miller Hospital in 1911 out of 1151 acute enteritis & *Shigella* in the stool were found in 24 or 2.1 per cent. This infection was therefore rare. The organism was also demonstrated in the case of two cases of liver abscess.

At Hinder in 1912 to 1914 Mr. Bayle found *E. coli* (typical) in twenty-two cases out of 244, or 9.0 per cent, suffering from intestinal disorders mainly chronic cases.

At the M. S. Hospital, Plymouth, from 551 cases of dysentery examined in 1910, in 1911, *E. coli* (typical) were found in 53 or 9.6 per cent.

At the Long Hospital out of many cases *E. coli* (typical) were found in 10 per cent.

The full report of Mr. Bayle gives a very complete account of the work done and knowledge acquired at Hinder. The cases were carefully seen while they were living in the Eastern Mediterranean or the Middle East.

Thus in the most complete record we have of the amount of infection on the naval service both amongst those who had served abroad and those who had not. The latter investigation was carried out in addition to which the work done at Liverpool is also suggested in the following letter to the Medical Director General:

REPORT ON ENTERIC DYSENTERY IN CAMPAIGN

In the last meeting of the Committee of Tropical Medicine and Hygiene on September 19th, 1914, papers were read on the percentage of infection of soldiers of *E. coli* (typical) in various large groups of the population examined at Liverpool. The latter, as an illustration of results, are—

	No.	Percentage of total examined	Percentage of total examined
Unemployed quarters in military hospitals	2,000	11.5	10.4
Other than dysentery	1,48	8%	11.1
Persons never abroad	1,021	1.2	17.1
Persons never abroad	10	14%	14.5
Soldiers returned from abroad	20	7.5	12.2

INFECTIOUS PROTOZOAL INFECTIONS AMONG OFFICERS AND MEN OF THE ROYAL NAVY AND MARINES, 1941-1945 WITH A VIEW TO THE ROYAL NAVAL HOSPITAL MARINE DURING 1946 TO 1948

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INTRODUCTION

During the past few years, and especially since the outbreak of the Second World War, the interest in infectious diseases has been greatly increased. This is due to the fact that the war has brought about a new situation in the world, and the need for a new approach to the study of infectious diseases. The war has also brought about a new situation in the world, and the need for a new approach to the study of infectious diseases.

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enable it to recognize the value of each of positions in the popular mind. The sentimentality perhaps was excessive, as it was, and even the editors were doubtful if the lowest fighting ground—the diagnosis, pathogenesis and its consequences—formed a basis for the fact that this journal had for its chief study, the medical sciences, diseases, the diagnosis, etiology and pathology, and the study of some knowledge of diagnosis, etc. was required for the purpose. It was formed as a journal in the direction of medicine, and the journal having, raised some, thereby spread (substantially) medicine from March 1901. It has, and had good opportunities in carrying the place with most of the best in medical practice, which doctors, under time constraints, were willing to present in the various London hospitals, were also in London given to the Royal Naval Hospital, March 1915.

In the first of all the world hospitals, the greatest number of cases were given, were held, and were held, and a prevailing spirit in it, the general impression of the people, over the laboratory and who were dealing with the case. I state. The spring of 1915 was the period of the decline of the most serious period of the disease. During the preceding autumn and winter the pathological and clinical had been working at high pressure on the diagnosis of cancer cases which had absorbed the greater part of their time and energies. Naturally, owing to the pressure of work, they had been obliged to reduce their attention almost entirely to the maintaining of the case, and although a number of successful examinations for patients had been made by biopsy (Lancet), I. A. Shaw only in a very few cases had reached the other patients from diagnosis. It is probable that the diagnosis should have been made in many of the cases of this period. It was afterwards found in a number of those who were with us frequent in March 1915, the following summer the number of fresh cases of cancer cases began to diminish but it was time during the years 1911, 1912 and 1913, and there is a complete change of each case to be dealt with.

It is interesting to deal with the subject of the metastatic process from the point of view of the laboratory. Unquestionable freedom will be made however, in the interpretation of this point of view, in order to make the subject matter of an article interest as possible to readers. It is also very time consuming to deal with cases of cancer, diagnosis or other important processes in the laboratory. To them, it is hoped that the following remarks, based on it, may be of some value in the study of the subject. It is of course, small talk as a record of the work done in the field during the war and that they may profit even by its shortcomings.

1.—CASES OF CANCER START WITH AN EARLY

The great majority of the cases examined for patients during the war, were those cases who had been recorded from the London

Microscopic studies of the alimentary tract. The alimentary tract in some cases, being particularly diseased in others not. Although the intestinal tract was not examined in all specimens, the alimentary tract was examined in most of the cases where the alimentary tract was diseased. The alimentary tract was examined in most of the cases where the alimentary tract was diseased. The alimentary tract was examined in most of the cases where the alimentary tract was diseased.

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II.—OCCURRENCE OF PROTOZOONAL INFECTIONS

There were three main objects in view in the routine examination of the alimentary tract for protozoa.

(1) The first necessity was to determine whether any of the specimens were cases of acute amoebiasis. If they were proved to be such appropriate treatment could be begun at once, and much suffering and waste of time avoided in any nothing of importance for the present.

(2) It was desirable to detect any carriers of amoebic dysentery among the cases where acute symptoms were due to causes other than the amoeba. It was believed that such carriers were a serious source of danger to their contacts and it was known that the amoeba might be found in men who had never suffered from the disease. Accordingly, it was considered important to diagnose carriers whenever possible and to take steps to rid them of their infection.

(3) A third very important object was to watch so far as possible the effects of treatment, and to try to ensure that in the treated cases, whether acute amoebic dysentery or carriers a cure had been effected before they were discharged.

[illegible]

111-112 734 111-112 734 111-112 734 111-112 734

giving a dorsal, pointed process is usually regarded as an apophysis, except in the cases mentioned, where distinction of all other rounded structures may be difficult otherwise.

In all the specimens examined, the wings have the characteristic transparent, iridescent appearance, especially in the anterior wings, and are more or less pale yellow. When mounted in alcohol, the cells appearing normal in larger or smaller numbers, but all, and except a few of some scattered cells in the basal portion, in great measure, in the majority of apparently quite healthy persons, it seems to be evident that the majority of cells reach much stronger celliness than in persons of general or moderate age. In the case where it may be assumed that a considerable number of females at Hialeah, a total was found in certain circumstances, as far as is known, both of the same appearance as in and was very like the previously mentioned group. As in other regions, such is found almost invariably, a morphologically to account for the confusion of the figures is usually possible that the formation set up by the structure is responsible for the difference.

One other internal structure, the minute *Anterior* cells, when it occurs, sometimes carries a variety of cells, and of the same structure of the color and may be used as a guide to the type of cell, and, more persons. It occurs chiefly in persons who have to health, and which, when it is common. It is possible also that certain insects (especially the *Anterior*) that are occasionally found may be used as a guide to the type of cell. The *Anterior* cells are the same, however, with reference to the Hialeah cases. A number of the same type are probably not the same. They are found in the contents of the liver in one case, probably accidental. They belong rather to a few large groups of cells, which they resemble in structure.

One of the forms mentioned above, *Anterior* cells, which is usually considered as 1417 by Wagon and 541000, is similar to that form which, small specimens, had been seen in human blood, which is probably not yet been referred to this species but more recently taken either the cell, small ones of other small cells, or in the blood, of some 441700. It is possible specimens, such as these, to refer the number as to the commonest pattern—according to some criteria. It is the commonest form of cell. It was recognized as completely the same as Hialeah but in all probability many small collections, and of different

An even less well known, recently described from human blood (Hialeah) is *Anterior* type and 541000 was more nearly 541000 in Hialeah.

IV.—THE DIAGNOSIS OF INTERNAL

With the above and compared below of the various species have all been, as is suggested. The forms are in a table, only that with in the which is clear where some specimens, or the same symptoms are present.

not be sufficiently well known with the few single biopsy and small tissue samples employed. Measurements of the frequency of the vagus nerve activity in one case a great deal is known, though the pathological picture seems frequently altered, and tend to show that there were in only minor. *Aspergillus fumigatus* however associated in a sporadic case was also reported in brief for reference.

For diagnostic purposes it is not often necessary to make detailed preparations. They were sometimes employed for more detailed cytological study of the problem met with. The method clearly used was not limited to fairly common organisms like *Aspergillus fumigatus* but also to some of the more common and interesting in nature.

VI. SUMMARY AND DISCUSSION

(1) Incidence of Fungus in the Human Gut

From the material surveyed by this report a total 1000 cases were examined all from different patients at Hanks in their under observation, or communications to clinicians, or the various hospitals and other outside institutions in the neighborhood. Owing to the fact that most of the latter three may, because for a time patients in the hospital (sometimes at the result of the pathological diagnosis) it is not possible to make a final definite distinction between inpatients and outpatients. The whole of the paper is devoted partly the examination of those concerned in the special investigation of this case to be mentioned later will therefore for the present purpose include together.

The number of cases, even in most representative groups is highly low. It must be borne in mind that this figure do not represent any absolute statement of the number of infections present. The detection of an infection in any one examination is subject to the laws of chance, and the detection of all the infections existing in any given series of cases would require a very large number of examinations to be given to each case. Clinicians have been made elsewhere showing that in any series of cases examined once such the results must be multiplied by at least three to get even a rough idea of the actual incidence of the various problems. In this case the extent of disease there is also the personal element to be considered since the result of every examination depends to a certain extent on the individual skill and thoroughness of the pathologist. In any case the figure is most probably far on the side of being too low, and should be taken as minimal.

Table II and Table III. *Aspergillus fumigatus* (1940-41).
 Inverted solid columns: 1. post. absolute alcohol; 2. post. alcohol and 3. 1. (dry).
 Table III. *Aspergillus fumigatus* (1941-42).
 Inverted solid

possibly the most important finding, namely that all the different types of questions were judged to be equally important. This finding is in accordance with the general idea of the present study, namely that the different types of questions are all equally important for the assessment of the knowledge of the patient. The results of the present study are in line with the findings of the study by van der Pijl et al. (1991), who found that the different types of questions are all equally important for the assessment of the knowledge of the patient.

Question type	Percentage of correct answers	
	Correct	Incorrect
Open-ended questions	75.0	25.0
Multiple-choice questions	75.0	25.0
True/false questions	75.0	25.0

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4.2.2. Results

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It seems, therefore, that, without going any further into unimportant matters, we must acknowledge that we reach their lives. I quoted selected passages.

(1) *The danger of infection to the church*

We may then in a better position to attempt answers to the original questions, now proposed.

With regard to the first, it must be frankly admitted that very little can be done at present. All that we know is that carriers may when exposed to the infectious organism of the presence of the mucus have been infected. This may occur in a domestic or hospital chamber. Glasgow and Glasgow (1911) state that it is possible that the great majority of carriers eventually show distinctive symptoms, but as yet, we have a very few data to go upon. The data, as far, as we have, show that there is no means of estimating what percentage of carriers are likely to become acute cases and the applicability of control as much to the Rube as to any other condition.

The possibility of re-infection of the carrier himself by means of his own sputa etc., of course, is to be considered, as well as the possibility of his propagating the same condition without re-infection.

(2) *Danger of infection from contacts*

With regard to the aspect of the question, the facts derived from the study of persons who have not been exposed must have some weight. If there are, as we have, such reasons for suspecting Section VI (1), some thing like the carriers of measles, diphtheria, among everybody of our adult world, population at large, and if the disease, in its acute form, is almost unknown in this country, the danger of carriers would seem to have been much overestimated. Thus, however, is putting the case in the broadest sense of carriers in the most favorable light. In many serious questions we are faced with regard to which our ignorance must be confessed. It is possible that cases of extremely infectious disease occurring in this country might often prove to be due to members of the parasitological community of the patient's house over a period of months. This and the like, must in a position to state that similar questions, as it is, as now, is less than sufficient.

Another point to be considered is in what extent the present prevalence of carriers at large may be due to their infection from men who have served abroad during the war. This is a question which can probably never now be answered since before the war no inquiry had been taken, and consequently no data are available.

After all, the question of the importance of carriers is in the main a matter of sanitary arrangements. In a certain community where good sanitation is the rule, and similarly under the conditions prevailing in certain steps and in above establishments, the danger of infection must

[illegible][illegible]

4111—46 samp. 2, 100. Increased in mass and common in
area (10-100) in "small" (1000) to 1500 m. S. H.

[illegible]

It is by no means true to say that the majority of all cases of a disease result from a single cause, and that it is necessary to remove the cause in order to cure the disease. When a patient is afflicted with a disease, the physician must first determine the cause, and then, if possible, remove it. But in many cases, the cause is not known, or it is not possible to remove it. In such cases, the physician must resort to other means of treatment, such as the use of drugs, or the application of physical agents, or the use of surgery. The physician must also be careful to observe the patient's general condition, and to give him such advice as may be necessary to promote his recovery.

might be placed without any help from the laboratory. But establishment of an absolute cure, according to the complete definition not only of symptoms but of the causative question, depends upon a proper understanding between pathologists and medical officers.

In this connection, therefore, without further apology it is proposed to attempt to make clear what has just been said, illustrating it by reference to the effect of treatment as observed from the laboratory standpoint, if possible.

[1] Results of Treatment of Hysterics

In this section the expression "treatment" refers solely to treatment with sodium or one of its salts. No account is taken of any other measures that may, on individual cases, have been experimentally used. It is assumed that all cases were given sodium. It is further assumed that treatment began in all cases on the receipt by the medical officer of the following laboratory report:

During the earlier part (or months or so) of the period covered, the recent experiments in treatment by the use of the new sodium compound, rendered somewhat reliable, had not yet become fully known and the old method of treatment of cases with physostigmine was used. The new method was adopted soon after its appearance, and, so far as the series here is concerned, so far as the remainder of the period.

Out of the eighty-one cases and subseries of cases, hysterics numbered sixteen (20 per cent.) who were not patients in the hospital and what the results of their treatment achieved is unknown. They may therefore be left out of consideration for the present purpose. Of the remaining seventy, eighteen were still patients at their last examination and their subsequent history is unknown to the writer. There are thus only fifty-two cases who were "cured" at their last examination and who may with certainty be probably be assumed to have been cured. It is highly probable that all of these fifty-two cases were permanently cured, and to doubt on the evidence available as how many cases the solution was completely, certainly is impossible. An arbitrary standard may be set up, however, by which the cases may be divided into two classes: according to the greater or less probability of their having been permanently cured.

In the following tables the more important of the data available are set forth and the cases are divided, on the basis indicated, into two classes.

Class I.—Cases who had not less than three negative examinations after the last "positive" extending over a period of not less than twenty-eight days. Many of these cases may, with considerable probability, be supposed to have been cured. Class II.—The number of negative examinations and the period of observation exceeded the

1. Of the 25 subjects, 15 had also had a brief observation with sodium and 10 had not.
2. Of the 16, 10 had a further examination of 10 days duration prior to the last and 6 had not.
3. Of the 18, 10 had and 8 had not.

Table 1
 (continued)

Case	Year	Age	Sex	Occupation	Education
1	1901	25	M	Farmer	8
2	1902	26	F	Homemaker	8
3	1903	27	M	Farmer	8
4	1904	28	F	Homemaker	8
5	1905	29	M	Farmer	8
6	1906	30	F	Homemaker	8
7	1907	31	M	Farmer	8
8	1908	32	F	Homemaker	8
9	1909	33	M	Farmer	8
10	1910	34	F	Homemaker	8
11	1911	35	M	Farmer	8
12	1912	36	F	Homemaker	8
13	1913	37	M	Farmer	8
14	1914	38	F	Homemaker	8
15	1915	39	M	Farmer	8
16	1916	40	F	Homemaker	8
17	1917	41	M	Farmer	8
18	1918	42	F	Homemaker	8
19	1919	43	M	Farmer	8
20	1920	44	F	Homemaker	8

Source: U.S. Census Bureau, 1920 Census of the United States, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020.

worms fed down. (4) all fish had a total length of 100 mm or less just before the sampling time, to ensure that the age structure of a pair or series was constant.

Class II—*Duration*. (1) specimens negative for tumours after the first positive whenever their survival extended into a period of less than twenty-eight days, and (2) specimens negative for tumours whenever the length of the period over which they were spaced was less than three or four times the length of survival after which tumours were discovered, taking it as doubtful whether the assumption that any of this class were prematurely cured would be justified.

TABLE II
(a) *Length of time*

Case No.	Number of pairs in which one fish was found to be tumoured	Number of survivors from other two positive	Length, mm (SD in parentheses)	Survival, days (SD in parentheses)
11	0	0	17-17	20-21
12	0	0	20-21	11-12
13	1	0	20-21.5	20-22.5
14	1	0	19.5-20	20-22.5
15	0	2	11-11.5	17-17.5
17	0	2	12-12.5	15-15.5
18	0	2	12.5-13	17-17.5
19	0	0	12.5-13	14-15
<i>Class II</i>				
1	1	0	19-19.5	21-22
13	1	0	20-19.5	9-10
14	0	2	20-21.25	20-22.5
15	0	2	18-19	7-8.5
16	1	2	20-21.5	9-11
17	0	0	12-12.5	11-12.5
18	0	0	18-18.5	11-12
19	1	2	20-20	10-11
20	0	0	12-12.5	12-12.5
21	1	1	17-17.5	19-20
22	0	0	17-18	19-20

Mean and standard deviation for each case were calculated with some precision, and the standard error of the mean was calculated for each case.

It is thus found that, from the laboratory standpoint, out of thirteen acute cases and thirty-two chronic, not more than five acute cases and twenty-eight chronic fulfil the burial requirements to be considered potentially useful, while eight acute cases and eleven chronic fail to do so. There is good reason to believe that even this estimate of the optimum

treatment also it may be suggested that a permanent cure in every case by treatment is possible—though this is not yet certain—we assume that that with proper choice of a large number of the treated cases should have answered to the treatment a good alternative.

The absence of an explicit rule in the laboratory routine in cases of successful laboratory cure, and a restriction in the observation period. In this sense the rule is like any therapeutic measure of typical and healthy dysentery must seem to have been followed with more or less care in the case of successful cure, but a certain proportion of cases escaped the proper number of negative examinations after treatment and were probably allowed to return to duty too soon. The rule was that consecutive negative examinations at intervals of two days after which the patient might be discharged as cured but was to ensure further laboratory tests at intervals of a month. This rule if strictly followed in all cases, might have been just sufficient for the control of curing cases and cure but a small escape more positive definite.

The following conclusions which are based on the experience gained in a number of susceptible workers during the war are of no small weight but they should form the foundation for the framing of a more adequate rule.

(1) However effective treatment may appear to be, and however great improvement may be observed clinically in the patient's condition, a cure cannot be established on clinical evidence alone, but must be substantiated by an adequate number of negative parasitological examinations extending over an adequate period of time.

(2) Patients when they come after treatment, rarely do so within twenty or thirty days. Hence the minimum for the period of observation after a course of treatment is three weeks.

(3) Not only must a minimum period of time be determined upon the observations but also a minimum number of examinations—this as distinct as distinct is specified in every examination.

(4) Treatment with various generally unknown a 'negative phase' which sometimes begins during treatment and lasts for a short time after it, may in some cases subsequently prove to be cured. Hence negative examinations during a course of treatment and within the last two days or so after it are of no practical value as evidence that the infection has been removed.

(5) The value of negative examinations within three or four weeks after a course of treatment, particularly correlates with the length of time since treatment ceased.

Having also regard to these points the importance of a rule cannot be too strongly emphasized, it would seem desirable to introduce a definite rule for the control of all cases caused by laboratory contamination to be identical with the laboratory rule derived from cases of untreated healthy infection. Bickel (1911) has, after prolonged study of the problem from

every point of view, concluded that no consecutive negative examinations, like a luminal, the best, to be made not earlier than three or four days after the cessation of treatment the second and third at weekly intervals. The reasoning there may it should be made on consecutive data after the third examination. Probably some such rule as this, especially if five or ten monthly tests could be arranged after the patient's return to work, would make for permanent cure in a much larger proportion of cases. The not taking of the time occupied by the last three examinations can be desirable in some cases, when it is a matter of urgency to keep an man on the job but longer than is absolutely necessary, but the longer the period of observation without reasonable doubt, the less is the chance of a relapse escaping detection.

(3) Some Notes on the Several Cases

(a) Out of the fifty-two cases tabulated above, it is noticeable that in no less than twenty-two the majority or quite some to have completely disappeared, without treatment, immediately upon the administration of emetine. It need not, of course, be supposed that this was actually the case in the whole of the twenty-two—it may have been in an easily of them, but it may be taken as certain that the small number of remaining cases after treatment frequently allowed relapse to be excluded.

(b) As for cases that, very definite cases seem to have been remarkably few. Four cases (all women, passing cysts only) showed cysts still present at more than two examinations after the commencement of the first course of treatment. These, however, were cases also treated with emetine, and at more frequent intervals, than usual.

It happens that these four cases all occurred during 1936 and before the adoption of emetine bromate tablets, so that they were all treated with suspensions of emetine hydrochloride. Their laboratory histories may be given here and are of some interest, because the frequent examinations, as in some cases of the gradual and difficult removal of an infection with *P. dissolens* by the drug in its old form.

Note.—The signs +, ++, +++, are used to denote varying degrees of heaviness of infection, as indicated by the numbers of cysts found during the examination of a smear given preparation.

Thus

	+	indicates a light infection
	++	" moderately heavy infection
	+++	" heavy infection
The sign -	.	negative result

The effect of the drug on the parasites can also be judged to some extent by the appearance of the cysts. When many are seen to be dead and degenerating (in which case they have a characteristic appearance when treated with emetine) it is often a hopeful sign that the treatment is doing successful

The first examination given negative seemed to have been made before an eye treatment and the second to be the first made after an eye treatment.

Case 3.									
April 26	+++	May 1 st	—	May 20	—	June 12	+		
27	+++	1	+	21	—	13	+		
30	++	4	—	22	+	14	+		
	(nearly dead)		(nearly dead)		(very bad)		—		
May 3	—	17	—	23	++	15	—		
4	(very bad)	18	(very bad)	24	+	16	—		
5	+	19	—	25	—	17	—		
6	+	20	—	26	—	18	—		
7	++	21	(very bad)	27	—	19	—		
8	++	22	—	28	—	20	—		
9	++	23	—	29	—	21	—		
10	++	24	—	30	—	22	—		
Case 14.									
June 18	+	June 21	—	June 24	—	August 1	—		
19	—	22	—	25	—	August 2	—		
20	+	23	—	26	1	August 3	—		
21	(very bad)	24	—	27	—	4	—		
22	++	25	+	28	—	5	—		
	(nearly dead)								
Case 15.									
April 4	—	May 1	2	May 2	+				
10	—	10	(very bad)	11	—				
20	—	20	1	21	—				
Case 26.									
April 16	—	May 1	—	May 11	—	June 1 st	+		
24	—	2	+	12	(very bad)	2	—		
	Max 2		(nearly dead)	13	—	3	—		
—	1			14	—	4	—		
	(nearly dead)								

Case 3. The examination with ether solution, starting with the first examination, the results of the eye period is somewhat different and there is then almost signs of improvement. Still the first 24 within no results, and then during the next five days but on the middle day after the examination of treatment is sufficient to get back to his original condition, and the eyes appeared quite better again. During the next twelve days the condition of eyes period would but towards the end of this time they seemed again to be becoming less prominent and showing signs of improvement as before. On the twenty fifth day from the commencement of treatment the examination gave a negative result, but on the following day a few signs were again found. After two more positive examinations, the result was negative on two consecutive days, but two days later the

cycle but reappeared with still greater aneurism. This period notwithstanding, since that the infection seemed to increase itself and after a further period of these days during which the numbers of cycle found were very small they finally disappeared altogether. The patient was discharged as well after few more pronounced attacks, and as he refused the convalescence during the following month he appeared to be well again.

The infection in this case had persisted for thirty eight days after the commencement of treatment and judging by the variations in the numbers of cycle found, there seem to have been two distinct periods when the nuclei reconstituted themselves and were gradually reduced again by the anuresis, before they finally disappeared.

The other three cases it may be noticed, were all—judging by the numbers of cycle passed—highly infected, yet the three run seem to have hastened the removal of their infections.

In Case 18 the cycle after ten days treatment became very scarce, but two days later they were more numerous, though many were disappearing. They then disappeared for four days, but reappeared on the fifth day in an all numbers, and persisted until the eighth day fourteen days from the commencement of treatment, when they seem to have been exterminated.

In two of these cases (18 and 20) there is not sufficient evidence that a cure was eventually effected, and they do not call for further comment.

(iii) A general impression gained by the microscope the result of experience at Hader was that nuclei or aneurysmic zones were far more easily and rapidly cured by osmotic means, while those were anuresis. Only in one case was it definitely ascertained from the records that a relapse occurred after the infection had once disappeared, as it usually did once after the commencement of treatment. This anomaly, enough, is the opinion of the experience of Weyman and G. Cooper and others with osmotic hypochloride. If it is a general impression, and does not imply some unknown factor it betrays to the superior efficacy of the new form of the drug. One of the chief drawbacks of osmotic hypochloride was its failure to cure the very class of cases whose cure was most urgent. And however the number of such cases at Hader was very small, it is perhaps a fault to draw any general conclusion from them.

DISCUSSION

It is to be thought as well known, in general, complete bibliography of the subject upon which a great mass of literature has grown up during the last few years in many languages. The author must need not a selection of these having no advantage upon the grounds of an easy reference, which is likely to be made for reference. Many of them are of great value, of others less so.

None of the so-called books and papers that gained reference are here noted by an individual.

On Weyman as reference on osmotic force.

Weyman, H. J. 1908. The Bacteriology of the Human Body and Food and Water in the Human System. (Revised German Edition) History of the Human System, Vol. 1.

Weyman, H. J. 1909. —Bacteriology of the Human System and of the Human System, Vol. 2. (Revised German Edition) History of the Human System, Vol. 2, pp. 107.

EDITORIAL

It is hoped that similar changes in other city papers, organized from a liberal nucleus, and of the character of the *Western Worker* (Chicago) will not only be contributing original material on labor problems, also be and finally, furnish a medium for the expression of their opinions on the different subjects of particular concern.

In the construction of individual issues in this regard, it is hoped that newspapers may reach which in turn, may be of mutual benefit to the cause.

In the construction of individual volumes, and in the selection of other and editorial material, it may be suggested, again, it is necessary on the question of both individual issues or the *Western Worker* (Chicago) and so on.

We hope that many socialist officers, have given thought to the important question though but few have contributed to the cause of paper.

We hope that socialist officers may be selected in such a way, that individuals on the above subject, each contribute to the cause of the publication either with or without the above, from their own property, according to the author's desire.

Clinical and Practical Notes.

BY J. H. HARRIS.

A CASE OF INTERESTING EMBRYO.

IN WHICH THE EMBRYO WAS FOUND IN THE UTERUS.

The patient, Elizabeth, is the wife of a man of the Royal Navy of Liverpool. She is now 35 years of age, and has been married 15 years. She is a healthy, well-developed woman, and has no other children.

She is now pregnant, and has been so for 10 weeks. She has no other children, and has no other children. She is now pregnant, and has been so for 10 weeks. She has no other children, and has no other children.

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These data indicated that the strong three-dimensional nature of the hydrogen bonding in poly(vinylidene fluoride) (PVDF) is not necessarily a consequence of the high dipole moment of the monomer unit. Indeed, the polymer poly(vinylidene difluoride) has a high dipole moment, but does not form a strong hydrogen bonding network.

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For more information, contact the author at J.L.Hughes@ucl.ac.uk.



1. The first step is to identify the problem. This involves understanding the current situation and the goals that need to be achieved.

1. The first step in the process of the formation of the new state is the declaration of independence. This is a formal act by which a state declares its independence from another state. The declaration of independence is a unilateral act of the state, and it is not binding on other states. The declaration of independence is a unilateral act of the state, and it is not binding on other states.

second volume is a study of the process of conversion to Christianity in the early centuries of the Christian era. The author is a member of the Department of the History of the Church in the University of Cambridge. The book is written in a clear and concise style, and is well illustrated with maps and diagrams. It is a valuable contribution to the study of the history of the Church.

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Preparations, &c.

REMARKS. - DOSE.

(London. The Hoffman La Roche Chemical Works, Ltd. 1, rue de l'Industrie, CHAMBERLAIN, R. G. 2.)

Acidosis frequently becomes very dangerous to patients, particularly when it is necessary to administer them over considerable periods.

This preparation of sodium bicarbonate introduced by the Hoffman La Roche Chemical Works, Ltd., in which advantage is taken of its value as one of the most important salts in a food of digestion, gets over the difficulty in a very superior manner.

The advantage of giving the bicarbonate in a well defined form is also provided by the fact that the tablets dissolved in boiling water make a pleasant and refreshing cup of bicarbonate.

In the event of a sick boy, after being provided these tablets, each containing a certain grain of sodium bicarbonate can be used to provide the necessary amount, if reasonably care is taken to see that the correct dosage is obtained.

1. The following is a list of the names of the officers and crew of the United States Navy, who were present at the funeral of the late Admiral George Dewey, on the 1st day of June, 1900, at the residence of the late Admiral Dewey, in the city of Manila, Philippines.

2. The following is a list of the names of the officers and crew of the United States Navy, who were present at the funeral of the late Admiral George Dewey, on the 1st day of June, 1900, at the residence of the late Admiral Dewey, in the city of Manila, Philippines.

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ADMIRALTY ORDERS ISSUED FROM MARCH 15, 1900, TO JUNE 15, 1900

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100—Appointments Officers U. S. N. 100—100—100

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1. *Journal of the American Medical Association*, 1997; 278: 1021-1025.

¹¹ *Id.*, in *Estimation of Postkeynesian models* (London, 1974), p. 10.

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1. The first step in the process of identifying a problem is to determine the nature of the problem. This involves a thorough understanding of the situation and the factors that may be contributing to the problem. It is important to gather as much information as possible and to consider all possible causes. Once the nature of the problem has been identified, the next step is to develop a plan of action. This plan should be based on the information gathered and should take into account the resources available and the time constraints. The plan should also be flexible enough to allow for changes as more information is gathered. The final step in the process is to implement the plan and to monitor the results. It is important to evaluate the progress of the plan and to make adjustments as needed. Once the problem has been resolved, it is important to reflect on the process and to identify any lessons learned for future reference.

[illegible][illegible][illegible][illegible][illegible]

1. *Journal of the American Medical Association*, 2000; 283: 2689-2696.

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 DOI: 10.1037/0893-3200.10.4.475

585.—Quarterly Report on the Progress of Research, 1907

(1907-1908) (1907-1908)

The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908. The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908.

586.—Invertebrate Marine Mollusks

(1907-1908) (1907-1908)

The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908. The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908.

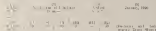


FIG. 1.—Distribution of invertebrate marine mollusks.

587.—Distribution of Invertebrate Mollusks

(1907-1908) (1907-1908)

The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908. The progress of research on the progress of research, 1907-1908, has been reported in the quarterly reports of the Bureau of Marine Biology, 1907-1908, and in the annual report of the Bureau of Marine Biology, 1907-1908.



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1000

And the way that we can make it all work is to make sure that we have a good understanding of the situation. We can do this by looking at the data and seeing what's going on. We can also talk to the people who are involved and see what they think. This way, we can make sure that we're all on the same page and that we're working together to solve the problem.

to the extent that the results of the study are consistent with the findings of the previous studies, the results of the study are consistent with the findings of the previous studies.

continued on p. 18511-18515

Age Group	Total	Male	Female
18-24	~85	~95	~75
25-34	~65	~85	~75
35-44	~55	~75	~65
45-54	~45	~65	~55
55-64	~35	~55	~45
65+	~25	~45	~35

100

100

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

[illegible]

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Source: U.S. Census Bureau, *Marriage, Divorce, Remarriage in the 1990s*, Washington, D.C., 1995.

1. *Journal of the American Medical Association*, 2000; 284: 1039-1044.

Table 1. *Estimated mean values of the variables measured in the 1990-1991 and 1991-1992 seasons*

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1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

11. A third of more is needed to establish a strong negative association between the all-time strongest party's vote and a particular candidate. Among all Group Candidates, 11.3% of the time, a candidate's share of the vote is 10% or more below the all-time strongest party's vote.

⁴ For a more detailed discussion of the literature on the effects of the 1990s on the U.S. economy, see, for example, the book by Krashinsky and Kuznetsov (2000). The authors argue that the 1990s have been a time of "economic stagnation" in the U.S. and that the U.S. economy is in a "state of economic stagnation" (p. 100).

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Figure 6

1. The first step is to identify the problem. In this case, the problem is that the company is not meeting its sales targets. This is a significant issue because it affects the company's revenue and profitability.

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1. *Journal of the American Medical Association*, 1997; 277: 1001-1005.

1. *What is the main purpose of the text?*
 a. To inform the reader about the importance of recycling.
 b. To persuade the reader to recycle more.
 c. To describe the different types of recycling.
 d. To explain the process of recycling.

[illegible]

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

4. *Journal of the American Medical Association*, 285(16):1993-1994, 1999

Journal
of the
Royal Naval Medical Service.

Original Articles.

SOME ASPECTS OF TYPHUS FEVER IN FRANKO-CAMERIA
(SPECIALLY WITH REGARD TO THE PROTECTIVE
MEASURES AGAINST LEECH-BORING DIPLOIDS)

by HARRY H. GILLBERT, M.B. (Lond.) Lecturer in Tropical Medicine, University of London
(Read at the 114th Session, Royal Society, London, March 28th, 1922)

The prominent role played by typhus in the causation of epidemics, dysentery-malaria fever, relapsing fever, typhoid fever, especially in Eastern and central Asia, Egypt and Mesopotamia, was recognized very early, as the war and the necessary permanent movements on the way of foreign troops, by extensive disinfection, were carried out on the largest scale.

I naturally, with various methods of disinfection and measures, modify these arrangements, in order to deal effectively with continuous outbreaks, large, bodies of troops in the field, would appear to concentrate the personal care of the responsible medical officer.

The ambitious and encompassing nature of his mind shows how, through the great progress, a great number of measures and especially in Eastern the risk of war, with close contact with epidemics, became continuous and the necessary, but which for a comparatively short time, continues with the most exact methods of procedure in the matter, all preventive measures are adapted for military purposes on land, which in the future with evolution of a ship, would be of more scientific interest to and questions, in the military work, and self-governing principles, of course, of hygiene.

In the field, the new interest in both of a great military, the progress, from there, in affecting the efficiency and from it all, and, with his medical change, depends upon the successful protection of it.

[illegible]

the law college, an all-female law and political science center, a center for research and community planning, and a center for research and development, and to be known during its tenure.

The total population in the South-Eastern hantavirus zone is a very small and heterogeneous one, and the study of the various types seems to be complicated by various phenomena of the small population size. This is most particularly observed in regarding the distribution of the various types of disease, concerning the forms of clinical forms, and the various manifestations of point form symptoms and reactions to the media. The authors consider that the study of these and other questions

As a whole the Chinese people are probably the most national and opinionated of any in Europe. His land is mostly self-sufficient in all things so he has no demand on external support.

The above derivation of the currency is one of neglect and a little "bookishness" (it doesn't matter to some) to express the attitude of the community.

The herds of villages and the light from the country across the river, as the north brought many villages with Patanki, Bani, and other occupied settlements on the line, where they remained whole families, herds, men, women and children.

The conditions of the rolling stock reflected the general atmosphere of miserable little ERE which presented the living quarters of the poorer classes. The Tank during its temporary occupation of this neighborhood, apparently disregarded even the simplest forms of sanitary decency. Afilah had a station, most railway stations and houses of houses, used as living quarters, showed evidence of pollution with human excreta, urine, vomitus and refuse.

The dismal aspect of a people half-starved and clothed in filthy rags, enduring the rigors of a bitter climate and the horrors of destruction and anarchy, who have passed through the horrors of four different empires, occupying their country and have seen their houses pillaged, murder, theft and robbery in the streets, and in their midst a wicked, ungodly people.

Charles shows us something that is a little harder than it first may seem: a field of professional scientists and engineers.

Over hospitals we saw in the expanded zone looking. One large building in Petrovich styled in the mass military hospital, surrounded red area of the station of typhus under the very central conditions in regard to treatment, cleanliness and comfort. The great majority of typhus cases were now seen by a doctor. Actual statistics of the incidence of the prevailing disease and of the epidemic variables, are not available, but it could be said that

comprehending his self. During the acute (first) or prodromal condition the typical psychomotor changes and is in a "dazed" condition. The physical manifestations (autonomic functions) show the characteristic of autonomic involvement (hyperemia, cold sweat, tachycardia, tachypnea, but transient and lasting 10-15 min). Hyperaesthesia for 5-6 days following at the beginning of the acute attack (completely apathic). During the stages and days are observed and related over 100 days. The face is given a carefully staged look. The pulse is lighter and rapid otherwise 120 per minute. Hemiparesis, falls and the head muscle for one hour and confined. Partial paralysis, convulsions, delirium and loss of reflex action on the loss of consciousness may be observed. Inorganic psychosis in different features and delirium is observed night with hyperaesthesia during the day—some apathy. The temperature which drops the acute stage usually to 100° F., may show a fall in the first five days almost to normal.

On the third or fourth day, it attains 104° F. to 104° F. and normal conditions until the seventh or eighth day with morning remissions of about 2° F., when it tends to fall by 1° per with daily remissions of 2° F. to 2° F. By the nineteenth day the temperature and pulse are subnormal and remain so for several days. Much the fall in the temperature the patient feels better and the pulse increases in volume. Quinine and other convulsions, given before a diagnosis is made will disturb the characteristic chart of typhus.

Recovery is rapid but consciousness is prolonged. The depression of cerebral functions, through accumulation of toxic products, is shown by various psychomotor or loss of attention, delirious memory and inability to concentrate the mind. This condition of mental activities is a very prominent feature of typhus and lasts several months. Physically, the disturbances of metabolism are not in the great working of metabolic and of metabolism involve the marked activities and the aged appear out of the patient in recovery.

In the initial stages relapsing fever and malaria are the only diseases liable to confound a case of typhus.

Management of Typhus Fever

Isolation in a convenient position in both the first instance. In 1911-12 in the management of the disease experiment has shown that where there is early bedding, with and necessary surroundings, the prognosis is improved. On the other hand, where no organized attempt is made to provide the probability of the patient suffering a continuously and to the extent those which do the work of anything approaching an epidemic can be reduced to a minimum. The rule of isolation to those actually in typhus, as typhus fever is variable under a varying regime, especially small. The precautions beyond the use of a gown and the ordinary disinfection of the house, as a rule which is far from the usual typhus necessary. Quinine and others are they as a typhus will be with

Prophylactic Measures for the Prevention of Linn-Baron Disease

The main problem is obviously prevention. Under active sanitary conditions and in no area infected with typhus, this would not appear to be a cause of anxiety. A person does not seem to be affected by general hygiene measures and by disinfection.

General Hygiene Measures.—To this is attached the control of all conditions of food sanitation in an attempt to lessen the spread of *typhus* *febris*, but sanitation, overcrowding and neglect of bodily cleanliness. Frequent washing of the whole body and changing of underclothes, were recommended by patients for suspension of all visits outside. Hot spring baths were fitted for the use of soldiers, and men and boys particularly benefited. Hot bathing was encouraged. Attention was directed to the cleanliness of all sleeping quarters, barracks, rooms, hotels, etc., and the same care was available accurately estimated in all institutions.

The usage of all bedding, blankets and clothing, and their regular disinfection by steam were carried out in rotations and by means of a disinfectant under the supervision of a sanitary party. All items were marked out daily with particles of an all purpose. This is probably the most effective and (for that time) certainly the cheapest disinfectant to use.

Although desirable it was not practicable to place the lower end of boards. The common action was to point out by posters, and printed notices displayed in all quarters, the dangers of lice-bites in the particular area of work in visiting, common local houses, public places and especially barracks and the absolute necessity for personal cleanliness. The advice, always of keeping the hair short, and of frequent washing the body and clothing for use was emphasized.

The likely conclusion of Russian railway stock has already been examined upon. In view of the fact that one case of typhus was directly traced to this source no trains were allowed to make use of the local train service; a special train was attached to all trains for the exclusive use of British troops. All railway carriages, so used for the transport of troops were in a sanitary condition and with disinfectants and fumigated by means of formalin, sulphur vapour, etc., before entering.

All trains passing in carrying the epidemic were provided for much of inspection and better disinfection of hot air, as a means to prevent the possibility of lice entering the epidemic. When lice were actually found on the body or amongst the clothes, insect was made to the approved methods of exterminating the lice and their eggs. All lice was disinfected hot bodies and the use of parasites and insectal treatments and daily medical inspection for three days were compulsory.

Disinfection.—The whole principle of disinfection consists in the immediate destruction of all living organisms infesting either the body or the clothes, which are capable of giving rise to disease.

The method of disinfection by using dry steam, using dry gas, using a gas, is a poor explanation.

The greatest danger, naturally, is the dissemination of any germ by the insects.

Disinfection of the air, nature of the methods of wet applications, of heated building on a large scale is required in the field. Disinfection of the steam, etc., has naturally a very limited application. The only satisfactory and efficient method of disinfection of infected air, as typhoid, etc., is by using an extensive scale in by means of steam vapor.

At the time the method is required on a large scale by means of wet steam and high pressure apparatus producing superheated steam. In the field we have to improve from the method at hand. The steam should be so used, not disinfection on a large scale and as rapidly as possible. The apparatus for this purpose should be simple in design, effective in its work and portable. The special technique must handle the process and the disinfection of clothing and have must be sufficiently rigid to maintain its title as possible with primary duties.

As a result of the Military Sanitary Mission in Berlin, in 1915, on the issue of the epidemic when 20,000 cases of typhoid and relapsing fever were accommodated in hospital, the "barrel" disinfection was devised by Liebig, Colonel G. P. Stenhouse—H.A.M.C. three days after the arrival of the Mission in Berlin.

Later the "barrel" was "disinfection" was put into use for the purpose of disinfecting troops on a large scale and over a wider area.

Since its introduction the "barrel" disinfection has become by necessity a new part not in every area in which has been disease germs and troops are engaged—Mexico, Bulgaria, Palestine and Egypt.

The results obtained by these disinfections using current steam in dealing with the typhoid epidemic in Berlin, trench fever in Macedonia and relapsing fever in the Egyptian war area have exceeded all previous expectations and expectations and in fact, in its twenty field, any methods of disinfection ever known in their simplicity, effectiveness and rapidity of action. The whole principle comes to the disinfecting power of steam in steam, in steam in continuous motion in ordinary atmosphere pressure without any attempt being made to develop it. The disinfection, and by this equation, was constructed exactly on the principle of a British barrel.

The advantages of having carpenters and others at hand, allowed of a slight alteration in its construction.

A large wooden box, capable of a convenient height from the ground, or two wooden frames the supports for the gas to be disinfectant. The



has a roughness which tends to close. (Intended) just as a fisherman, in taking the fish with the hook and line, prevents the "tail" from coming out. (The same kind of closing is experienced quite often when a thin paper is put in the water, but it is quite a different matter being put the correct steam.) A small paper boat is put into the hole to enable the water of condensation to be put, which will otherwise collect and enter in the clothes. As the time runs out and steam the heat of the water goes to a certain point, the steam is blown off the chimney, being blown by blowing. (2) The lid is made with a small hole, which is made the hole and covers it in a manner of a small hole in the lid, the object being not to put the steam coming out of the hole. (3) A small steam and hole, which is the edge of the steam penetrating and the hole is covered by the chimney.

A few gallons of steam placed on the side of the chimney pipe, covered on and fixed with an inlet (with steam cap) for blowing into the pipe as a boiler.

The boiler is put into a small trench and the water heated with a red steam the heat of the fire below. Although necessary, in order to get steam of constant steam per se in effect. I was in the habit of blowing a few ounces of steam or oil to the water in the boiler, as is often done in the case of steam. Steam and water are put upon a boiler in a boiler or hot bag and placed in the hole, which will hold steam in the steam. The lid is then covered down firmly. As soon as the water has reached boiling point, steam escapes through the side pipe and into the box. The lid is then the side of the box is then removed.

Distillation is allowed to proceed for about one and a half hours from the time when steam first enters the box. If the clothes are taken out too soon, they will be found to be wet with hot water, but if the steaming process is allowed to continue for the full period the condensed clothes, which are not, are usually found with steam and they usually are expensive in the use.

I experimented with a well-regulated thermometer placed in the middle of the clothes inside the distillation showed that the steam range of temperature obtained was 320° F., or all around. Much longer experiments than this will obviously tell how and their use.

Some of the other devices of a similar pattern usually support themselves being made, improved from laboratory steam from a hot wooden platform, etc., and coming in from perhaps the very best distillation will be obtained knowledge to use. The effectiveness and simplicity of the distillation, which was in any case demonstrated by the fact that the entire party, including a lady of a small laboratory, who were able to maintain the whole management of distillation. In steps in four hours, have previously selected clothing was dry, disinfected and fit for use.

[illegible]

them just off. Part of us played tennis at Laramie at 12,800 ft. with no ill-effects, except that when running a few eight-miles as if it had been at lower levels. I noticed that of our party several collapsed in more deep depression during the game, whereas those who had lived at that height for some time, though they were short of breath did not "gasp" as it were.

Some notes on the Pathogenesis of the Disease—From what I can gather from the numerous people I have spoken to on the subject of pain or weakness, some heart-ached runs, there is only one conclusion to come to—namely that little is known of the actual cause of the disease beyond that it occurs at high levels. There appears to know why, for instance, some should suffer while others escape, why it is more in some places than in others (these places are known as 'pain valleys'), why some men may not suffer from an attack on their first ascent, but do so on their second, and so on. It is impossible as far as I can see to say to any individual, on matter of what age, sex or build. You will not get an attack of pain.

Effect of Sleep Deprivation—This is the one point which appears to be fairly well established and on which all agree, namely the closer the ascent the less likely is the individual to succumb to the disease. This is probably why only one member of the party I was with was seriously affected, as we spent the first night at Aspenga at 12,000 feet, whereas of the first party who made a morning ascent, nearly all had headaches and three were seriously ill. When a new mountaineer does work at the same at 10,000 feet or 12,000 feet, he spends the first night at an elevation of 10,000 feet, and does not do any work for the first week or two more.

Sex or Age—As a rule females are supposed to suffer less than males; this may be partly explained by the fact that they do not lead such a strenuous life, and are usually more obstinate in their habits than males. Children under 12 or 14 years of age are less liable to an attack.

Food and Tobacco—If a person eats and drinks on the journey, he is more likely to suffer from pain and the symptoms will probably be more severe. Habitual smokers, provided they are moderately abstemious during the ascent and do not drink or eat more while in the higher strata do not appear to be any more susceptible than the total abstemious. If a person who is a heavy drinker suffers from an attack, it is usually a very severe one. Tobacco for those who use in the habit of smoking does not appear to have much effect either way. Our party except the one person who was ill, and by the way it is a light smoker, smoked both pipe and cigarette the whole time with no ill results. Personally I noticed that more smokers were required to keep one's pipe light.

Acclimatization—It is evident that the Indians who are born on the plains of Lake Titicaca between 12,000 and 14,000 feet above sea level and who live there all their lives do get accustomed, and do not suffer

In any given extent the fatal height may thousand feet or all times, where occasionally they do meet at the normal altitude. They do suffer from altitude at levels when visiting at that height, but it is less severe than a person who has lived at a lower altitude. It is hard to say if people who have lived part of their lives in the lowlands and then start work at these higher levels ever do get accustomed to the conditions. For example, one person I met at La Paz an Englishman aged about 45 years, who leads a healthy life and is in excellent health, worked at the mines in 1906 for nearly a year at 17,000 feet and never suffered the slightest inconvenience. He came down to the lowlands for two years and went back to the mines again in 1911. On his return he was in the best of health, kept quiet and retired to bed early. Next morning he was beset all with the usual symptoms of pain—headache, shortness of breath and slight vomiting, later in the evening an intense nervous very distressing. This continued during the night with spasms of vomiting and sweating. He was given rubefacients of oxygen and aspirin of cyanides and digitalis without much relief. Luckily the next morning there was a train going down to Arequipa on which he took passage. When he got down to 8,500 feet he was considerably better and at 7,000 feet was nearly well. The doctor told him afterwards that but for these happenings he had a train going down that morning, his recovery would have been doubtful. This case is interesting in that it occurred in an absolutely healthy individual who had been at 17,000 feet two years previous to the attack for nearly twelve months, and has spent several years at these altitudes since then being in excellent health all the time with the one exception. Another person even I know of was a normal girl who was born at 15,000 feet and had lived there all her life. She is about 35 years of age and came down to sea level with her employer for six months. The family returned to the hills for the same train as the party who went to Oroya and she returned with them. When they got to 12,000 feet she was extremely ill with all the usual symptoms of pain, though she had lived at this level all her life except for the six months at sea level. From numerous other cases I have heard of, it is impossible to say because a person suffers from pain on his first trip to the hills that he will do so on his second or subsequent visits, nor that there is any special type of individual who is more susceptible than another, for plateau individuals seem to be as immune to the thin air type. Certain people however, seem to enjoy natural immunity for an apparent reason, whether short and stout, tall and thin or of perfect development. In certain localities the disease appears to be more prevalent than in others, for instance La Paz, which is a town over 14,000 feet above sea level, in a valley completely surrounded by hills. Also they say it is more when winds blow down from the north, whether of the upper or lower. All the people I have met who have lived at this high altitude for many years, told me they have lost their former energy and are now easily fatigued even after slight

workmen. On arrival at our hotel, even in those who have lived most in their lives at high altitudes, very few effects seem to develop beyond perhaps slight headache and dizziness for a day or so. I have not heard of any serious symptoms beyond these. Why then should be the case when such symptoms, sufficiently serious to cause death in several instances, have occurred to those who have gone up to 12,000 feet, and particularly to people who have made considerable descents from this height, or at least greater?

Treatment.—For mild cases rest in bed with the window wide open is all that is required. The patient should remain quiet for a day, after all symptoms have disappeared, until heavy meals and are then his breakfast is regular. Aspirin in 5 or 10 grains for a dose is of great use in relieving the common headache. Serious cases developing cerebral or nervous symptoms should be sent down to sea level as soon as possible. It is probable that though the lack of oxygen at these heights must play an important part in causing these symptoms, still it is given by regulation to these cases it affords practically no relief. The Indians have several herbs they chew and make an infusion from, in which they have great faith. Near Lagoquillo at 11,000 feet I got two of these herbs from a party of four Indians who dug them up by the railway line going to going higher up the mountains shooting mounds. They called them "*charla mas*" and "*for de peso*". They furnished a very small quantity but what they are I do not know. None of our party had sufficient courage to try their looking proposition and I did not meet any other person who had done so.

A HOSPITAL BARGE ON THE DANUBE

By JENNIE LEWISTON L. T. LEPK 2-21, 2-2.

On account of the outbreak of Bolshevism in Hungary in March, 1919, the British Naval Brigade on the Danube was stationed at Eger, a small town on Hungary on the Danubian line between that state and Yugoslavia, where a limited part of an Allied Danube Flotilla under the command of Captain V. H. S. Baggett C.M.G., R.N.

This force was composed of R.M. river monitors *Aphie* and *Ladybird*, a varying number of motor launches and six or seven Danube monitors known as *Donau* and *Donauk*, the latter small, fast and lightly armed, the two larger barges and well armed.

In addition there were three small Danube tugs. *Leicester* armed with a 17-inch 15-ton gun, and *Hobart* and *Bag* armed with machine-guns. The six Danube monitors and tugs were manned by Yugoslav crews, most of whom had been trained in the Austrian Navy and still wore Austrian naval uniforms, with cap ribbons of the ships in which they were serving. Their war loaded.

The tugs had British officers in command, and showed much respect for a British junior officer, while the officers and men of the Danube monitors had altered the French's comfortable passenger manner lately following to the Danube steamer "Mediterranean General", but now flying the Yugoslav flag.

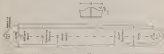
Eger itself was occupied by Serbian troops, whilst at Szeged were the French troops and with them the newly formed White Guard composed of Hungarians, opposed to Bolshevism. Many of these were ex-officers who were being trained by the French and being got ready to take their share in the advance against Bela Kun. The British was to co-operate with the land forces in the advance and, as the Bolsheviks were known to possess a considerable force of armoured and rapid boats, stationed at the end of the lower and forenoon of the latter and to have had some difficulty in getting out advance up the river, it was obvious that some arrangements would have to be made to deal with such a possibility.

An incident of the Naval Brigade. I was ordered by Admiral Sir J. Troubridge K.C.M.G., R.N., to see what could be done. My staff consisted of a surgeon, a corporal and two privates R.A.M.C. who had come up from Budapest with the Brigade on the previous November and there were an additional surgeon lieutenant and a midshipman attached to *Ladybird* and a midshipman attached to *Aphie*, who would naturally have to man about these ships in the event of an advance.

The personnel of the flotilla consisted of between 300 and 400 officers and men. Luckily the neighbourhood was healthy malaria being preva-

with nothing to support it. The interior of a certain emergency hospital was a disaster when a large room was contained overflowing its banks. I decided that the best form of hospital would be a ship of some sort, and staying round for a while to construct, I decided on a large ship, of approximately 700 tons that was lying in a small canal near the river. This canal was an example of British enterprise owned by the Finance Canal Company, a British company of fairly good character.

The large was a piece of war belonging to the M. P. T. B. - a Hungarian vessel company, was made of iron with a number of gun ports, 10 ft. diameter, less than 2 ft. of water and had the following dimensions: length over all 126 ft. and greatest beam 32 ft. The scale drawing gives a general idea of the large, but does not show clearly the bulk down the center of the post-house roof.



It will be seen that there was no engine power but it was essential that she should be towed up the river by one of the tugs, and another if about 2 kilometers astern of the boats when the latter were in action wounded being brought down to her by engine barges and boats.

The question of sanitation was not difficult and involved small expenditure into one of providing lighting in the holds, which were to be converted into wards, and making outside latrine accommodation.

In the hospital there was a small cabin containing two cots, in which it was proposed to house two local burgomasters if considered necessary and in which no substitutes were could be isolated.

On the foremast over the ship was decided to make the latrine. In this purpose a small toilet collector's box was reserved from the landing stage put in position and then divided into two by a wooden partition thus providing accommodation for two cots with buckets underneath. These were emptied daily and like the urine table, were half filled daily with gravel solution and poured very satisfactory (Fig. 1).

The three holds needed very little attention. In each several sections of the roof were convertible to latrine holding and sections was reserved

on each end a wooden hatch cover, with a door to it built, from which steps led down to the hold (fig. 2). The forward hold was divided by a wooden partition containing a door into two parts, of which the fore part (fig. 2, by 22 ft.) was made into the officers' ward (fig. 3) with accommodations for six beds. The after part was the fresh water tank made locally



FIG. 2. Hospital barge, as built, at Constantinople.



FIG. 3. Hospital barge, showing additional ground and covered by the barge.

with an inside of 100 ft. capacity of one ton and fitted with a bag. All material was kept in this bag. Between a stove on deck and painted metal structure through the stow of layers of lumber under the water. The stove was heated by wood and compartments by daylight on the roof. It is by 1 ft. 6 in. on each side. This was the standard size of window adopted, except for the operating theatre, where the narrowness

room light led me to make incorrect measurements. In case of the necessity for additional space, I purchased locally two motorcycle lamps, with a large supply of oil.

The operating theater (14 ft. by 10 ft.) was provided with a breast shield on either side and was also so arranged that the patient could not see



Fig. 3.—Operating theater at our camp, 2 ft. 6 in. wide at mouth.



Fig. 4.—Main ward 17 ft. by 45 ft.

more an operating table, but the only way to my hospital patient's dressing table proved quite satisfactory, covered with a ground sheet.

To overcome the difficulty of transporting a man after operation up the steps along the narrow cat walk and down the steps into the ward, I had a trap built out (1 ft. 6 in. wide by 1 ft. high) at the rear bulkhead between the theater and the ward. This trap hatch was filled with a

fixed a wooden door which was kept locked except when on use and proved quite satisfactory. The main ward (figs. 4 and 5) was 76 ft. long by 32 ft. wide and contained forty-four beds. It was lighted by four skylights.

The after hold was divided by a wooden partition into two compartments



FIG. 4. Main ward, looking forward.



FIG. 5. Main ward, looking aft.

covered with 12 in. to 18 ft. of which the forward half the 4 ft. long-wooden girders, and the galley (fig. 7), with two skylights in all with the height 11 to 12 ft. to ridge of roof was 4 ft. 6 in. The medical officers' quarters in the stern were 9 ft. by 32 ft. and consisted of the already existing two wooden quarters and contained a wooden bunk. In all other parts of the ship beds were used.

The general and the commissary of the Imperial Austrian Army, the *Kriegsminister*, a few thousand miles from what they all had promised me!

Of course, if you two lads possessed a certain amount of data (as, let us be charitable, I suppose of *very* little), such as, e.g., to know even names, but of no amount whatsoever, which one could recognize. From them I obtained certificates and diplomas and also small quantities of notes, which did not obviously excite any forerunners, &c.

In addition, I heard at Topkapi had been used during the war as a hospital and convalescent home for the troops under command of the Sultan, and was, with well supplied with all sorts of medicines of Austrian and German manufacture. This was compensation for having all these together with the necessary kitchen, coffee and smoking pipes, &c., &c.



FIG. 1. Table.

plaster, &c., necessary for making out a deep wound; a shining large number of talismans, talismans, and talismans for use in the market. The hospital lighting, the main came from the shade of the window. The smoking room, for the pipes came from a large, old, a piece of wood, had no pipes, unless for all sorts.

I had then secured a certain amount of medicines, but was still short of beds, bedding, and dressings, though I had all that was necessary in the way of surgical instruments, having brought some away from my work.

I accordingly went down to Belgrade on a motor launch, where, in the course of four days, thanks to persons in position while doing more regular work in that capital, I managed to get all that was necessary.

There was at that time in Belgrade a large Austrian store, full of the most varied collection of goods that had been brought together there

during the occupation as a nucleus for training purposes. From this store I obtained all the necessary untravelling plates (pass books), pass, and sickening permits, as well as very good case-cloth shoes, and various other useful articles.

The American Red Cross very kindly supplied me with the necessary dressings, towels and sheeting, while from the Serbian Relief Fund I obtained some bedsprings. The question of mattresses, pillows, and blankets was solved by the husband of Lasci-Gol Parkashoff, D.A.M.C. who happened to be in Belgrade with his car, and being ordered home, soon loaded them together with a large stock of drugs. I found two Slavayevs a vision on a lighter in the Para, which I also saved. All these stores were then loaded onto an empty lighter, together with some stretchers, &c. I belonged to the brigade, by Russian procedure of Markovitch's troop, who was then being employed as a labour corps in Belgrade, and with several other lighters full of stores were towed up to Jajce.

On the arrival of this pair of legs the fitting out of the barge was completed, and though a good deal of gear which was indispensable, could have added to her apparatus, I had no doubt as to her efficiency. Named the *Wasp*, she was put into commission on April, fifteen days after the idea was first mooted, and served as a hospital barge for all units and ranges of the South.

When we advanced in August, after the flight of Bela Kun, she went up with the main occupying party, being towed to Urmad, where the new fields were—and subsequently to Duna Pataka, the new base of the South—and when I left the Danube in September she was still in service there.

Though never tested in the struggle of war, she proved her nixity.

I did not consider her perfect, but think she is an interesting example of what can be done in the way of enterprise, with very little expenditure in time, labour or money.

MEMORIAL HISTORY SHEETS

BY MARION CROMBIE, L. L. B. OTTUMWA, ILLINOIS, 1920

A new procedure for dealing with medical history sheets has been the subject of experiment since March 1909. At first it was applied to routine cases (nurses only) that was possible in sheets of these sheets, under the old procedure, formed a separate volume.

Since May 1920 the procedure has been applied to all ratings and has been an unqualified success.

The old surplus sheets are not taken into the new volume but are being dealt with by a separate staff and distributed to their rightful place.

An outline of the paper is first given and a detailed account follows.

PRELIMINARY CONSIDERATIONS.

Insufficiency of the old system

Reasons for duplication of sheets

Confidential nature of medical history sheets

DEGREES OF THE OLD SYSTEM

Accumulation not prevented

Causes: Storage of sheets without the rating system

New dispatch of material after discharging of rating

New dispatch to Admiralty of new and discharged ratings

New dispatch on ordinary draft of rating

Applications for sheets were not made till required for draft

Faults, method of recording correspondence

Difficulty in referring to sheets although located in

Mechanical difficulty in handling sheets

Storage of sheets in alphabetical order

NEW SYSTEM

Action on a rating passing R. B. Remarks

Action on arrival of a sheet

Action on dispatch of a sheet

Recording of correspondence

Mechanical advantage of the use of record cards

Use of day's books' numbers

Method of dealing with ratings lost

The name of temporary sheets

Direct forwarding of sheets

THE NEW DETAILS

General arrangement

Columns for record cards

Index cards

Record cards

Figures

Photograph forms

DETAILS OF PROPOSURE.

STAFF CASE.

PULMONARY TUBERCULOSIS.

Staff group of the old scheme.—The exact figures are not available, but it is estimated that in March, 1900, there were at least twenty seven such charts that there were ratings in H. M. Barracks. Further, he about these quarters of the ratings in H. M. Barracks there were no charts at all.

Possibly the old scheme might not have broken down so badly, had there been an unchanging staff. Much otherwise well, most the requirements of there is an unchanging staff of conscientious workers. However desirable, an unchanging staff may be it is undesirable as the "burden" of its adoption lies in the number of possible shore billets a few proportion of which every rating looks forward to.

Further, a permanent staff is not necessary if a simple and sound scheme is adopted.

Scheme for Duplicate Charts.—The question of keeping a duplicate chart has been considered. It is certainly very desirable to be able in the case of loss to obtain a copy of the original chart. After much consideration there is my opinion, better not to graft the duplicate system on to the new scheme. The adoption of a duplicate system should be treated as a separate question. Its adoption is quite simple, only being a question of cost.

To graft duplication on to the new scheme would involve great difficulty of handling the charts, which is a necessity in a drifting establishment, and a barrier must be regarded primarily as a drifting establishment, all other considerations must be subsidiary.

If later, barracks, as has been proposed, should become regarding in addition to drifting establishments, the duplicate medical history charts should be dealt with as these establishments.

Confidential Nature of Medical History Charts.—It is part of the new scheme that medical history charts should pass from medical officer direct to medical officer and not through others. In addition to maintaining the receipt and despatch of charts, this would remedy a grave defect and remove a great objection to keeping records of ratings illnesses. Medical history charts should be regarded as confidential documents, otherwise a time will come when a demand for their abolition may arise.

DETAILS OF THE NEW SCHEME.

Accumulation and general.—An accumulation of charts hinders the search for charts required for men on draft, both mechanically and by increasing the number of charts for men with similar names. There were two main causes of accumulation.

The one was taken on charge and stored without any reference to the record of the rating. Frequently there was no application for such charts

and the correspondence they were worn out by search and research and a persistent destruction of superfluous sheets was made by a medical medical officer. There were several causes for unwanted sheets being sent to R.N. Barracks: work to the accommodation from ships being sent to either during or at the end of a voyage, sheets wrongly directed sheets sent to depot from hospital, whereas ratings would go direct to former ship.

Sheets which could not be found on the ratings, however, R.N. Barracks were not despatched if received later. It is difficult to see how this could have been avoided, except by keeping special alphabetical index for the purpose and this would have added considerably to the work of the department.

Sheets of men and discharged ratings were not always despatched to Admiralty. This was not altogether the fault of the system but a defect in administration so that the necessary information was not sent to the Medical History Sheet department.

Sheets were not despatched although they were in R.N. Barracks. This was not always due to carelessness but often to the difficulty of finding sheets owing to the large accumulation.

Not infrequently, also, though one sheet being wrongly named, two alphabetical ones would be in existence under one letter, and the sheet would for this reason be named when searched for.

Application for sheets was not made till reported for Draft—Sheets, therefore, were never known to be missing until the ratings were drafted. When an application for a missing sheet is made immediately a rating joins barracks, several difficulties arise. Should more than a few weeks elapse after a ship has paid off it is impossible to trace sheets that should have been sent in.

It frequently happens that two ships change crews, the men however come ashore homeward for a few days, only application for sheets being the Medical History Sheet department in touch with the change.

Recently H.M.S. Carter paid off on preparation for transferring to H.M.S. Cleveley, the men came ashore homeward for a few days. As the sheets did not arrive inquiries were made and it was decided that the sheets were being retained for H.M.S. Cleveley. This was noted in Medical History Sheet department, so that all correspondence with reference to any sheets of the crew of H.M.S. Carter that might go ashore would be sent to H.M.S. Cleveley.

Daily Method of recording Correspondence—This varied much from when queries arise. For the satisfactory recording of correspondence a certain amount of space should have been left against each name. This is impossible in a book and consequently the recording of correspondence was never satisfactory.

An alphabetical correspondence book might have been kept but this remedy would not have been entirely satisfactory. As a sheet arrives it should be possible to determine at once if it has come on again or to apply

charts, otherwise it may be looked on and stored although it can be taken in, saving first.

The following is a sample of procedure: suppose a rising bill H. K. becomes without a sheet, application would be made for it to the previous ship. An answerer might be returned with a "sheet not received from previous ship." Next the "new ship" would ask for the sheet. The helper would be searched but as no sheet had been received this would be written "New ship" would be asked for previous ship. Finally owing to the faulty method of recording correspondence a second application would now be sent to the previous ship, same reply received listing not infrequently derived from "new ship A" to another "new ship B." If then asks for sheet, third application might then be sent to the original ship.

Difficulty in referring to sheets although looked on—This caused much delay in looking out sheets for draft and difficulty in answering queries.

On the arrival of a sheet a date was stamped on the sheet and its serial noted in an alphabetical helper. On dispatch this date on the sheet was noted and the corresponding date listed in the helper, the sheet was then looked out. Not infrequently the stamping of the sheet was neglected and consequently much searching was required before the necessary looking out could be done.

In answering applications for sheets the applying ship had to give the date of entry and departure. Unless this corresponded with the date of the receipt of the sheet in harbor a long search was necessitated.

Workman's Difficulty in Handling Sheets—This was considerable. Owing to the slanting of sheets flat and the position of the names on the sheets it was impossible to see the names until the sheets had been taken out of their pigeon holes. Each sheet had then to be held turned over by the unskilled finger.

Storing of Sheets in Alphabetical Order—Periodical checking against the helper could not be carried out, helpers being always kept according to the ships' books numbers. For instance, if two sheets went to one station, John Smith and James Smith, were checked against the helper many pages might have to be looked over and searched, as possibly one might be at the beginning and the other at the end of the helper. This entailed a few thousand hours, shows the impossibility of carrying out H. D. and A. 1. Act 1818, par. 3, except in small ships, under the old system of alphabetical storing of medical history sheets.

Further storing in alphabetical order facilitates the showing of a sheet without looking it on.

There is also the obvious difficulty of working machines of smaller size.

SIXTH SECTION

The guiding principles of the new system are —

(1) Adoption of the most suitable system for recording purposes.

(2) Adoption of methods to ensure that there is a medical history sheet for every ship in R.N. Barracks and no more.

Action on a Rating passing A.N. Barracks—As a rating passing Barracks passes the medical officer a record card 'A' is made out. He gives the following details: name, age, rating, official number, if known and last ship or establishment.

The state of his teeth and the state of vision are also noted.

The card is then passed to the medical history sheet room.

Then the ship's book number is inserted after being obtained from the registering office in the Lodge. The latter is done in the early morning, before the ratings see the books.

The arrival of or leaving of the applicant for his medical history sheet is noted on the card which is then filed.

Action on Arrival of a Ship—Medical history sheets are sorted and checked against the record cards. If a corresponding record card is found the date is stamped over. The ship's book number is then pencilled at one end of the medical history sheet, which is stored according to this number.

The various lists are kept separate following the method of keeping the lodgers.

If a sheet arrives for which there is no record card its arrival is noted on Form 'B'. Application for information is then made if necessary in turn to the registering office, previous ship and the Assistant General. There are columns on card 'B' to register these correspondences. The card is kept filed in the 'In Barracks' drawer in front of record card 'A'. Only one record card 'B' is necessary for each division of the shipyard.

Action on the Dispatch of a Ship—On the receipt of a 'Leavey' marked Paper only, the cards are taken out and the names marked according to presence or absence of sheet. On the record card is noted the date and ship to which the sheet is to be sent. If the sheet is present the record card is filed in 'Drafted' drawer B; however, the sheet is absent the name is noted on hectograph form 'A', the card filed in the 'Left without M.H.S.' drawer and the hectograph form forwarded to the ship.

Form 'A' is a useful reference for the medical officers of the receiving ships to keep. I would suggest that it be adopted as a permanent form as it is especially valuable in sorting down correspondence.

If R.N. Barracks sends this form informing the receiving ships that the sheets are missing but have been applied for, it covers that obsequy for the sheet, R.N. Barracks searching records and replying. All ships adopt the form of well worn R.N. Barracks applying for sheets.

Recording of Correspondence.—Correspondence is noted on record card 1. These cards necessarily in a record card if the ruling has been made, as in barracks.

If correspondence comes with reference to the medical history sheet, and a ruling has already been made on record card, there must be something entered about the case and it has to be treated as a special case.

Measures to Advantages of the Use of Record Cards.—The advantages of a record card are many. The cards of ratings who have can be separated from those remaining, thereby facilitating reference. A number cards cannot be obtained with the use of books.

A complete record of all details regarding the movements of a sheet and correspondence relating to it can be kept ready to hand. The cards of ratings physical conditions that a rating may subsequently claim as a reason for not being drafted to a great advantage, having in mind that a barracks is primarily a training establishment.

The most useful ratings get very expert in "looking" the cards and can pick out the correct one in a few seconds. It is to be remembered that each card has on it the rating's ship's book number, this can be obtained before a sheet can be stored.

The of Ship's Book Numbers.—The advantages of this is mostly mechanical, it is convenient in rapid handling, and there is no necessity to check the movements of the cards.

In R.N. Barracks, Portsmouth, the sheets being stored with the long axes pointing outwards the ship's book numbers can be grasped at the end so that, in looking for a sheet, it is not necessary to remove the sheets from the pigeon-hole nor to mention the fingers and turn over the sheets.

Storage is impossible unless the ratings in barracks, as there would be no ship's book number for him and thus the system is somewhat more fool proof.

Checking against the ledger is simple, as both sheets and names on ledger are in the same order.

The use of ship's book numbers for designating ratings is not ideal but until a better system is devised it is advisable to use it and then follow other departments in barracks. Ship's book numbers are used in the Pay Department, Ordnance and Regulating offices. The Medical History Sheet department should, unless a better method can be devised, work uniformly with the other departments in barracks.

The folder system, with vertical storage, had been suggested as a better method but this, on consideration, will be seen to be practically the old method except that the sheet would be stored vertically instead of horizontally. The folder system would give some of the advantages of the new system, but many of the old disadvantages would be retained especially if, as in the system the thing was done on an alphabetical basis. Another serious objection is that it would cost several hundred pounds to install this system.

Noted in *Working and Rating List*¹—B. B. and A. I., Feb. 1918. For B. B. it is shown that medical history sheets are to accompany Service certificates. It is, therefore, from the custom to enter in B. B. Bureau medical history sheets at rating when lost. Some ratings are, however, lost in occasionally periodic. Under these circumstances some medical officers complain of the unavailability of the sheets.

When under the new scheme the disposal of the sheets could be readily traced, a trial was made to send sheets with lost ratings. It was thought advisable to adopt the principle that medical history sheets should always accompany ratings. The difficulty is that ratings are frequently lost for a few days only—consequently an entry rating requiring B. B. Bureau record card is made out, record made may in the course of a month be made out for the same rating. The disadvantage has, however, been checked by an order to the Medical Drafting Room that on a rating reporting after a short period of absence a new card is not to be made out but a list sent to the Medical History Sheet Department of ratings for which no record cards are made out. The proposal in charge of drafts is of opinion that there is no difficulty in doing this.

The Issue of Temporary Sheets—This should be avoided. It used to be the custom always to send a temporary sheet to hospital if the original could not be found. A large number of ratings leave ships or dockyard hospitals are sent to hospital through B. B. Bureau, the present stage of these being very few sheets cannot be immediately obtained.

The present custom under these circumstances is to send telegraph form 'A' informing the hospital that a sheet will be forwarded as soon as received, or failing that, a temporary sheet will be made out. A temporary sheet is of no value to a hospital.

In dealing with ships who fail to send medical history sheets, a reference sheet is sent calling attention to B. B. and A. I., Feb. 1918. For B. B. and the ship concerned is requested to furnish a temporary sheet if the original cannot be found. In Bureau a temporary sheet is only issued if it is impossible to get one from the last ship. The correspondence is then passed on the back of the sheet or the reason for issuing a temporary sheet written at the head of it. This matter further issuing should the medical officer be an enthusiast with plenty of time at his disposal. The issue of a temporary sheet usually causes the original to be lost as may be seen by the following example.

Suppose a rating is sent to hospital and the medical history sheet not being available, a temporary sheet is issued. After a rating returned the

¹ Lately given "signals" have been used to indicate that a rating has been lost for a short time. The cards are kept at the head of each section and should be returned as when already lost would not. This procedure helps to prevent duplication of work. Duplication can also be detected by keeping the cards in only labelled order.

original was a reproduction of the material on of 1941, since the issue of its temporary sheet is overlooked.

The sheet is still under the old system that has been stored until used for both in the past, was floating about with a temporary sheet the original would probably never be discarded and would remain in H. N. Barracks indefinitely.

Delay Forwarding of Sheets—Not infrequently on application for a sheet, the reply is received that the sheet has been dispatched. A search, however, is found in each berth H. N. Barracks. Photograph form B is then sent to the Certificate Office, and should the sheet not there be found photograph form C is sent to the ship. Not infrequently the ship says that it has been sent either direct to the sub berth or to Com. mess, H. N. Barracks. I doubt that more than a temporary sheet is issued and stored. After a long delay some of these sheets arrive and the temporary sheets are then cancelled. In the majority of cases there have again in definitely since how the sheets have been delayed.

The work of the Medical History Sheet Department would be considerably lightened if H. N. and A. J. Rat 1020 Part 2 was cancelled and sheets were sent direct to the medical officer in Medical Department in barracks. They should be sent in a confidential envelope. I have already referred to the necessity for these documents being regarded as confidential.

Many medical history sheets do not arrive because they have been incorrectly addressed. This is proved by the fact that many sheets are received at Portsmouth, although the disposal column on medical history sheets has been correctly filled in "Port" or "Fleet".

THESEAL SYSTEM

General Arrangement

In the photograph there is only one cabinet for several cards which is placed at the end of the table. Half of it is divided by square rows along the other half is uncut. Each of the sub berth canteen working three sections takes half the table.

The general layout is not shown.

The present cabinet have been made in the barracks out of old boxes, but the frame-work, being made out of old timber, was not of a convenient size to allow the drawers to be made the correct size.

In order to allow for expansion there should be three separate cabinets, and three sides, the cabinet should be at the end of the table and approachable from either side. It would then be possible for four canteens to work at each section in case of drafting activity and in war time.

Cabinet for Paper and Record Cards—Each cabinet should contain about sixteen or twenty drawers. The drawers should be labelled: "In Barracks" (drawers for drawers), "Ward" (one drawer), "Drafted" (drawers



Fig. 1. (a)



Fig. 2. (b) and (c)

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Temporary				
Hyphes				

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Medical History Sheet

Specialized forms are used (also for keeping no Record Card).

The following forms used for various purposes during the experiment were found it is desirable they should be adapted them instead of keeping a full one down.

Red, white and blue signals are used and when medical history sheet is on loan to Drafting Room, white for the different departments in the war hotel, and blue for hospital.

U. S. G. O.
H. S. G. O.

NEUROGRAPH FORM A

Emergency Service

From Principal Medical Officer
The Managers of U. S. G. O.
At Portsmouth

To
Senior Medical Officer
H. S. G. O.

Dated _____ 1911

The Medical History Sheet of 1904 being developed to

on _____ in _____ not available to U. S. G. O. at present. Application
has been made to _____ No _____ sheet and when received will be
forwarded herewith, or taking then a Temporary Medical History Sheet.

Surgeon General's Office

U. S. G. O.
H. S. G. O.

NEUROGRAPH FORM B

Emergency Service

From Senior Medical Officer
The Managers of U. S. G. O.
At Portsmouth

To
Officer in Charge of
Cardiology Office

Dated _____ 1911

Attached is a list of Medical History Sheets reported to have been used to
and Surgeon General's Office.

Can you give any information as to the disposal of Medical History Sheets?
Please return correspondence.

Surgeon General's Office

100-1000000
100-1000000

REPRODUCTION FORM - 1
REPRODUCTION FORM - 1

From Principal Medical Officer
The Maritime U. S. Service
at Portsmouth

To Senior Medical Officer
U. S. S. S.

Date 191

The Medical History Sheets of the above vessels have under one, located
in the Medical Department up to the Maritime U. S. S. Service.
Request I may be referred to whom they were addressed.

Surgeon Commander

100-1000000
100-1000000

REPRODUCTION FORM - 1
REPRODUCTION FORM - 1

From Senior Medical Officer
The Maritime U. S. Service
at Portsmouth

To Registry Office
U. S. S. S.

Date 191

Medical History Sheets have arrived for the unaccompanied but no ratings
corresponding to these names have passed through Medical Drawing Room. One
any information to pass, please.

Surgeon Commander

100-1000000
100-1000000

REPRODUCTION FORM - 1
REPRODUCTION FORM - 1

From Principal Medical Officer
The Maritime U. S. Service
at Portsmouth

To Senior Medical Officer,
U. S. S. S.

Date 191

List of Medical History Sheets received in U. S. S. Service for which no
corresponding rating has arrived.
Request further information please.

Surgeon Commander

DETAILS OF PROCEDURE

"In Bar racks Drawers"—The first three drawers in each section are marked "In Bar racks" and contain the cards of all ratings on the ledger with a ship's back's number, viz., cards of ratings in bar racks for whom medical history sheets have been received, cards of ratings in bar racks for whom an application for medical history sheets has been made in the previous ship or establishments, cards for ratings for whom temporary sheets have been issued on cases where the last ship has paid off without sending in medical history sheets or the medical history sheets for any reason cannot be found; the cards of ratings sent to hospital or where medical history sheets have been lost to Departments or H. N. Bar racks.

In addition to the above card "B" is also kept in the drawer. Card "B" records must taken from incoming sheets for which record "A" is made out, i.e., the ratings are not known in H. N. Bar racks.

Only one card "B" is necessary for each section and contains space for several names. It is kept in front of the other cards in each alphabetical section.

"Bunk Drawers"—Cards received from Docking Room without ship's back's numbers are filed in the back of these drawers and indexed alphabetically in each section according to rating. They are taken to the respective Regulating Office in ship's back's numbers. In some sections it is easier to obtain these numbers from the ledger at 1.00. When the ship's back's numbers have been obtained the cards are transferred to the front of the drawer and indexed alphabetically. The incoming M. H. S. are checked daily against these latter cards and any M. H. S. received in which there is a record card, is marked as passed with ship's back's number and stored in its respective pigeon hole. The card is then filed in the "In Bar racks" drawer.

After cards have returned in "What" drawer for seven days, applications are made to the previous ships for M. H. S.

The sheets for which no record cards can be found are stored in the "Record" pigeon hole and the name noted on record card "B," which are then stored in front of record card "A."

"Discharged and Discharged Drawers"—The cards of ratings drafted from H. N. Bar racks are filed in the drawer marked "Discharged." If the ratings have been given a free discharge or discharged, the cards are filed in the "Discharged" drawer. In all cases the date of the medical history sheets and the date of discharge or draft are marked in ink in the space provided. The actual date of sending medical history sheets is indicated by date stamp in the space provided opposite, Discharged, Temporary or Specially.

"Paper only" Ratings are used by the drafting office in the dock, back for all ratings drafted and the backing out of medical history sheets is carried out in accordance with these on equal cards being placed

against the names of men for whom medical history sheets are prepared and a link against those whose medical history sheets have not been received. When the medical history sheets are eventually received and sent on, the 'Pages only' drawer may be adjusted also but this has been found by experience to be unnecessary. The use of a 'Link without M.H.S.' drawer is a sufficient guarantee that the sheet will eventually be sent.

'Link without M.H.S.' Drawer.—If the medical history sheets, not being received in time, are not sent with the ratings when discharged, the notation is made on the cards as passed and the cards are placed in the 'Link without M.H.S.' drawer until the medical history sheets are received. At the same time keepingship form 'A' is made out and sent to each ship concerned. The medical officer should keep this in reference and tick off the names as the sheets are received, and if an unreasonable time elapses, send a reminder to R.N. Remarks.

The 'Link without M.H.S.' drawer should be periodically examined and a second application sent for all M.H.S. still missing.

Lost Sheets.—When a medical history sheet is missing on issue to one department or sent forth the lost is noted at the bottom of the card together with date and signature of person receiving the medical history sheet and a white square is attached to the card; a red one is attached if lost in the Docking Department. Blue squares are attached to the cards of ratings sent to hospital and "Hospital" is pencilled in this space provided for destination.

The department from which the rating was sent to hospital is also noted. On the rating returning the date is entered on the card and the medical history sheet restored.

The record card for ratings whose medical history sheets have been lost to the various departments and for ratings sent to hospital are kept filed in the 'In Remarks' drawer.

Note.—Ratings in hospital still retain a ship's locker number and they use it in the hospital.

SYSTEM OF RECORDS, FILES, ETC.

Medical history sheets are stored in pigeon-holes according to ratings and in the order of their ship's locker numbers.

Two boards are placed at the top of the pile and the medical history sheets for ratings without ship's locker numbers are placed between them. Sheets for ratings are placed on the top board.

Remembrance Books.—In order to check the receipt of names to supply ratings, a memorandum book is kept.

Under a date the names and ship's locker numbers only are entered. Comments as to why through names can always be satisfied by referring to the record cards.

The keeping of a memorandum book can be avoided by the use of a 'Signal', but the use of too many signals should be avoided.

Rest area—Three rest areas have been assigned as follows:

(1) Between

(2) Between room ratings (1 H. to 4 H., between 1 hour)

(3) Miscellaneous—These are undivided according to ratings

The principle is that no section of rated beds should be divided if a rating can give from one to the other, e.g., 3 H. and P.G. must not be divided because they can pass from one to the other, but writer and table both ratings vary, with advantage be divided.

The miscellaneous ratings contains all ratings except surgery and expect some ratings, but includes equipment, as these cannot change their rating.

Replacement—This is checked on account of the system being a double system. Replacements are very likely to occur owing to the necessity for occasional quick working orders some special permission is taken.

Staff

The new procedure is worked by three and health attendants under my supervision. S.H.A. Head has charge of the system section, S.H.A. Attendants of the nursing section and S.H.A. Dry the miscellaneous section.

I think it desirable to mention these ratings by name for their valuable co-operation in carrying out my wishes. S.H.A. Head had prior experience, worked with a similar system and consequently was able to offer valuable suggestions.

Owing to the large number of queries resulting from the previous discussion the smooth working of the system is at present considerably interfered with and it is hardly necessary to employ three and health attendants. It will however, be possible to reduce the number of staff to two as soon as this discussion has been successfully dealt with.

That the staff is not excessive will be gathered from the fact that in the Cookhouse (Other than writers are employed as similar duties, viz., the looking in and out of certificates).

Cost

The actual cost will vary with the ability to utilize the present fittings and the amount of labour and material obtainable locally. The actual cost of use of equipping the system and running it up to July 1 has been as follows—

Calculate (made locally)	No change
Index cards	45 5 0
Rated cards "A"	0 4 0
"B"	0 1 0
Signals	1 15 4
Total	46 10 4

After the experiment was over, I sent my friend a sheet of paper with the results of the experiment.

I returned from the laboratory a few minutes after the experiment was over May 11, 1910 and a second batch of 10,000 of slightly marked cards on July 10, 1910. The cards were marked on May 20, 1910 but as the machine was out of order the cards had been used when the original supply bought by me was found to be insufficient. Probably all the material can be re-marked if a medical officer desires to try the system with little expense.

From the data given it will be seen that the experiment was completed before the necessary material had been obtained from the Admiralty. Every assistance was given me by the Medical Department but as I hardly knew at first what material I wanted, it was much more convenient to buy things locally as I required them; e.g. at first I used a different divisional alphabet until by experience I found the vowel system the more satisfactory.

The necessary cost can be estimated from the knowledge of the numbers passing R.N. Ensigns as a secret code will be required for each rating passing. During June 1,700 ratings passed R.N. Ensigns.

Against this cost must be set all the sort of ledger which are no longer required.

The expense, therefore, with the scheme made locally (and as no special kind of device is necessary this should be quite feasible), would be the cost of the following:—

10,000 Ensign cards	5
1,000	10
2 sets of Index cards (divisional alphabet)	
5	(sample alphabet)

From these details the exact stated cost would be obtained probably from the Admiralty Office, but I do not expect it would exceed £10—possibly nearer £5.

Royal Medical History of the War.

OF SCURVY AND INFLUENZA

SCURVY.

By *Commander Frank Lawson, F.R.C. ROYAL ARMY MEDICAL SERVICE, D.M.D. (Lond.)*

A comprehensive account of progress was made during the war on the Royal Naval Medical Service in the examination of supplies contained for the purpose of diagnosis and treatment of scurvy. At each of the great naval hospitals an extensive amount of material was available and had been carefully studied and reported on, but definite methods of deriving conclusions from these specimens were obtained in practice.

The more general use of a satisfactory method of dark ground diagnosis was instituted and the results were made more reliable. The importance of early diagnosis of cases by the detection of specific organisms has become more and more generally recognized.

For the complementary detection test the standardization of a method was held to be one of very great importance and a personal meeting of the pathologists of the naval hospitals was arranged when the method so ably described and advocated by Dr. P. Fidler—who was honorary pathologist at Haslar Hospital—was recognized as being the best in use.

The work of the Medical Research Committee gave a strong lead in the standardization of methods and was of extreme value.

In the three great hospitals the number examined for primary scurvy rose steadily. In 1914-1915 the number was 1910 there were 3,127, in 1917 it reached 3,222 and in 1918 the number was 2,064. The same rapid increase is seen in the total number of the diseases listed year by year, which includes also the German measles column.

1918	5,222
1919	15,000
1917	22,000
1916	28,211

This indicates a definite advance in the use of the very important laboratory methods, but it does not include a number of tests carried out at the smaller hospitals.

Surgeon-Commander Bailey gives some interesting notes from the Royal Naval Hospital, Haslemere; he states that when taking charge of the laboratory in 1916 he was struck by the small number of cases coming under treatment in the primary stage. Therefore he examined 814 cases of general scurvy; the men not having any generalized signs, these give the following results:—

examined were recovered, 174 of 229 primary syphilis in 1936 classified

- | | |
|--|---------------|
| (1) Of 10333 syphilis in primary syphilis 262 were proved in
primary stage | 25.7 per cent |
| (2) Of the last series of primary syphilis, 226 were proved by
secondary means only | 80.9 " |
| (3) 558 given a p. p. R. Wassermann | 51.4 " |
| (4) In 262 Jorgensen reaction was found | 58.7 " |
| (5) In 126 the Wassermann was positive but no syphilis
was found | 22.1 " |
| (6) In 171 more examinations were found but Wassermann
was negative | 26.5 " |
| (7) In 163 cases, both were positive | 22.2 " |
| (8) Of cases of primary syphilis 34 were proved by subsequent
tests before generalized signs were present | 2.9 " |

The cases were examined without selection or special preparation, and in the majority of cases local treatment had been used.

The cases showed as characteristically had healed up and had shown no signs of syphilis for (say) a more months following examination.

The percentage of primary syphilis to all syphilis is noted in Chatham Hospital showed a steady increase, indicating that more cases were receiving early treatment.

In 1912 and 1914	13 per cent
In 1915	22 "
In 1916	34 "

There was a marked yearly increase in the number of cases of syphilis admitted to Chatham Hospital but not greater than the increase due to the maintenance of the fleet in the North Sea and the great increase in the complement over that known in peace time. Two thirds of the resources were due to ratings taken on for the war. An example of 760 beds cases of syphilis admitted in 1916, 400 (or 42 per cent) were active venereal ratings, the remaining 360 per cent being R.N.A.S., R.N.R. inactive landmen, which means that less than a third ratings were contracting syphilis than in previous times. This fact was also noticed at the other English hospitals. Commander Dudgey made observation to determine whether Chatham itself was a more source of infection during the war than formerly and statistics were collected of 500 men during the war period and 500 in the previous year.

The result showed that only 72.4 per cent of cases were contracted in Chatham during the war as against 41 per cent in previous times. London was responsible for a quarter of the cases in both periods. The increase of cases contracted in the east coast towns and Scotland during the war fits in very well with the war distribution of the fleet and the number of troops and other R.N.E. ratings that were treated. The table above suggests that the possibility of contracting syphilis is much the same everywhere, and it not markedly proved in special towns but that the number of cases from any place is in direct proportion to the amount of leave given in the place and the number of men taking it.

of the day also methods for an then definite action could be temporarily taken without delay in the treatment of the case.

Some very interesting work was carried out during the year by two post-graduate students, P. Fidler, R. Pennell and H. B. Marshall of the R. N. Hospital, Dudley-on. The occurrence of unexpected involvement of the central nervous system in isolated cases of erythema (British November 1935). Localized pruritus was noted in 121 cases and the central spinal fluid examined cytologically and serologically. In 115 cases there was a definite pleocytosis of less or more cells per cubic millimeter while exactly three times when the doubtful kind of five to seven cells. That is, 10 per cent of these cases were definite and 11 per cent doubtful as a 10 per cent of absolute. Fifty-one of the former gave a positive Wassermann reaction in the cerebro-spinal fluid (5 per cent). The Wassermann reaction was not positive in any instance of doubtful pleocytosis. It is important that the cerebro spinal fluid in cases of early erythema, meningitis should be tested before testing as it is probable that a considerable proportion of the reacting substance is derived as a transference from the blood. If the fluid is tested in an unheated condition the serum immediately will give a much stronger reaction than it would if the case is meningitis and it may even give some indication if the case is not erythema. Thus it appears that with unheated serum the results will be less specific as a test of the disease in the central nervous system. The onset of the chemical reactions of the cerebro spinal fluid may be very early, even before the Wassermann reaction of the serum has become positive and with an almost total lack of symptoms. Very few of the cases complained of any disability, even when the meningitis was acute enough to produce a visible opalescence in the cerebrospinal fluid.

That the condition is a true erythema meningitis is proved by the presence of lymphocytes and when polymorphonuclear leucocytes a positive Wassermann reaction and the finding of *Treponema pallidum* in eye fluid.

The absence of a serum reaction does not always negative the presence of the meningitis though it makes it impossible. A very interesting condition is when the Wassermann reaction persists as a positive condition when it should normally become negative, the being assumed to be due to a relatively local disease in the body, and this may be in the central nervous system.

From these data and in view of the importance of early treatment the authors advocate that further patients should never be treated as a contact to the management of all cases of erythema.

DIAGNOSIS OF ERYTHEMA (BRADY'S METHOD)

A small drop of 2 per cent aqueous solution of Congo red is placed on a slide, and a very small quantity of the bacterial culture, or of the crystals to be examined, is rubbed only it with the platinum wire, the drop is then

WHEELS TABLE, 1918-19

Place	Material		Producers				Consumers				Excess	
	Total value consumed		By producers		Wholesalers		By retailers		Wholesalers		Excess	
	Spent thruout	Waste thruout	By value	By weight	By value	By weight	By value	By weight	By value	By weight	By value	By weight
R. M. Hospital, Harbor	1 000	25 000	600	100	9 000	100	1 000	600	10 000	100	1 000	100
R. M. Hospital, Chatham	2 150	35 000	1 000	100	10 000	100	1 000	600	10 000	100	1 000	100
R. M. Hospital, Plymouth	300	10 000	100	100	1 000	100	100	100	1 000	100	100	100
R. M. Hospital, School Gymnasium	1 000	10 000	100	100	1 000	100	100	100	1 000	100	100	100
R. M. Hospital, Dredge	10	100	10	100	10	100	10	100	10	100	10	100
R. M. Hospital, Main	1 000	10 000	100	100	1 000	100	100	100	1 000	100	100	100

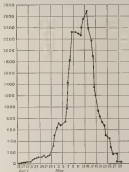


FIG. 1.—No. of weevils in Grand Plant, Apr. 1 to May 30, 1934. Total number of weevils collected, 32,114.

June, June, July, and August sporadic cases were considerably less frequent than the heavy infestation of the Grand Plant in April. In general, as much water damage as epidemic had a corresponding loss of grain and forage. This epidemic was a direct extension of the severe spring infestation of the Grand Plant during August. Of the 3,200 acres in the Grand Plant, the field also contained the disease in the spring, 1934, but remained uninfested by the weevils. It would appear that the original epidemic was caused by the numerous beetles unobserved and the latter cases were due to a second infestation of that beetle with susceptible and non-susceptible. With regard to the prophylactic work

Southampton the mail ship came in December also gave at first high percentage of cases, but fell in April.

Surgeon-General John T. B. Noyes from London with the Red R.M. Division, reported that 30-4 officers and men were inoculated with the prophylactic vaccine, and only one useful reaction occurred with infected symptoms of the virus pharynx. No cases of influenza occurred among the British troops, though sporadic cases were present in the neighbourhood. He wrote that from his personal observations he thinks that the vaccine as supplied by the R.M. is an improvement, and that he is in favour of its general use, as it checks malarial symptoms and pyrexia are present.

Surgeon Lieutenant J. H. Lamb, R.N.V.R. of the Phoenix P. has in the Adjutant submitted the following report with regard to their experiments with the prophylactic vaccine.

Inoculation was purely voluntary, a short lecture was given to the ship's company explaining the advantages of inoculation and each man was then interviewed personally. Out of the ship's company of 542 the volunteers for inoculation including all wardroom and messmen officers, total was given to 200 men at an interval of seven to ten days. In addition to the above being officers and men from *Phoenix* and T.E. 40, 100 were sent to us on *Deseret*, and from Aden and Bahla and two small were inoculated with the tested supply. In only one case was any case of conjunctivitis or other constitutional disturbance observed after inoculation and on that date it did not appear that inoculation was in any way objectionable. Four cases of epidemic influenza occurred in all as follows:—

1 on February 1st, 1918	4 B	Inoculated men.
1 on February 24, 1918	Comp. R.M.L.I.	Infected accidentally.
1 on March 5, 1918	0 B	Infected.
1 on March 5, 1918	4 B	Inoculated from.

All four were sent to hospital as soon as possible the first three to English Hospital, Aden and the fourth to R.M. Hospital, Bahla.

It may be noted that all cases occurred whilst the ship was lying in port. No case showed any serious pulmonary symptoms and whilst under our observation.

The ship arrived at Portland on March 25, and put off on March 27 during that period no fresh cases of influenza occurred.

It may be observed that the ship had been sailing from one infected port to three in the last twelve months. Influenza was rampant in Aden, Bahla and Vienna (through the Indian troops) and France when we were there.

One experiment seems to differ from that of most of R.M. ships as no man within us shows a fresh case of influenza occurred. It may be observed that the ship had been sailing from one infected port to three in the last twelve months. Influenza was rampant in Aden, Bahla and Vienna (through the Indian troops) and France when we were there.

The motor ship *Earl of Pemborough* and constant comparison the ability number was first attacked on Bahla when (young ones in us the

ships separated soon after but I understood that the decision rightly involved the majority of the ship's company, most unfortunately except, the death of the surgeon and one other sailor.

Before the arrival of the vaccine the men were made to purge and wash out mouths daily with a solution of potassium permanganate. The more ships were despatched overseas with the typhoid lamp and one arrived that the bacilli were spread as early as possible from the men to the dogs. Fortunately, in spite of the fact that one of the 100 men vaccinated developed typhoid after two and two and a half months' quarantine, I would not this vaccine again without bacterium and animal lymphatics, that we owe to us was the fact that we escaped a serious outbreak being, the long, voyage home with the ship crowded (I think, to 700) that night with it.

APPENDIX I. CONFERENCE FOR COLLABORATION IN VACCINE FOR THE VETERANS AND TRAINING OF INDIGENOUS PERSONNEL. BANGKOK, COCHIN CHINA, 1945.

Called by the Medical Director General of the Army. Present: Colonel W. W. Lenthall, M.C.D., President; Surgeon Captain E. W. Russell-Smith, D.B., C.M.G., R.N. Major Horton, L.V.M.D., Dr. A. Kelly, Dr. Low, and Dr. Douglas.

(1) The general opinion was that *E. typhosus* was the primary causative organism, and it probably increased the general resistance that the macrophages and pneumocytes so frequently present in the site of gained access to the blood stream, and produced the complications, if allowed.

(2) *E. typhosus*, *Brucella abortus* and pneumocytes were regarded only for the vaccine.

(3) *E. typhosus* obtained from spleen of certain Westchester typhoid pneumococcus and pneumocytes in blood frequently, *E. typhosus* in spleen and lungs.

(4) All agreed as to the desirability of using a prophylactic vaccine even in the presence of the epidemic.

(5) Before methods for the vaccine were not anticipated but factors, two hours, even some vaccination should be considered on.

(6) No cases with pyrexia or acute symptoms to have occurred.

(7) Children under 4 not to be vaccinated. All above 10 years, under 16.

(8) An interval of from one week to ten days to elapse between the first and second inoculations.

(9) Vaccine as a therapeutic agent not recommended except for the old cases, the first thing to be about one-third of the population on.

(10) Unusual records of resistance and evidence of immunity to be kept.

The findings of the conference to be published as soon as possible.

1939). In the present outbreak it will be seen in the returns from spring catches that the total is less. For example:—

	N. 1 1939	N. 2 1939	N. 3 1939	N. 4 1939
1st	120	13	10	0
2nd	1	330	200	181
3rd	1,00	90	0	20
4th	10	240	20	100

N. 1 of the depths where very large numbers of weevils have been counted together. The seasonal distribution is also shown.

	N. 1 1939	N. 2 1939	N. 3 1939
1st	240	0	0
2nd	90	1,000	2,020
3rd	10	10	140
4th	240	1,710	500

It seems likely that as most of the depths thus sampled are very small (average 75 per cent. of those present in 1938), the small size of the sample is one of the principal points to be noted with some amount of caution. On the other hand, in certain cases the changes in percentage have a three-fold gain and the evidence of seasonal increase from 1938 to 1939 is definite.

General distribution.—Taking the whole year the total number of sites of infection amounted to 100, 100, and 100, and the total number of weevils to 1,000, 1,000, and 1,000. The last figure is based on the following values: 1st depth on September 10 an average of 10 for each site, the 2nd depth 2,020 and the 3rd depth 140, a difference of 2.04 per cent. The 1st infection on September 10 is due to 1st and 2nd depths were apparently the 4th on an average of 100 per cent. The percentage mortality is somewhat greater in the autumn than in the spring epidemics. As was noted in the first epidemic, this is due to the fact that the 1st depth was the most heavily infected, and the 2nd depth was the least. In the second epidemic the percentage mortality was 100 per cent. In the third epidemic the percentage mortality was 100 per cent.

First epidemic.—In this epidemic note that in the reports describing the extent of the infection the finding when positive has been taken as representative. Although some depths are infected, no depth was found to be completely infected (100 per cent. infested). It is not clear how a given depth can be reported as 100 per cent. infected, having been isolated from the peripheral field.

Second epidemic.—In this epidemic note that in the reports describing the extent of the infection the finding when positive has been taken as representative. Although some depths are infected, no depth was found to be completely infected (100 per cent. infested). It is not clear how a given depth can be reported as 100 per cent. infected, having been isolated from the peripheral field.

Third epidemic.—In this epidemic note that in the reports describing the extent of the infection the finding when positive has been taken as representative. Although some depths are infected, no depth was found to be completely infected (100 per cent. infested). It is not clear how a given depth can be reported as 100 per cent. infected, having been isolated from the peripheral field.

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The term *borderline* has been used in the pathological field to denote a group of patients that has been established.

and the process. Developmental physical variables, such as the mean distance from the atmosphere to the surface, cannot be used.

(ii) The surface-to-surface polynuclear condensation temperature at low pressure was 600–700 °C; higher than that of the solid-state polymerization.

From 1990 to 1995, the number of people in the United States who were employed in the health care industry grew by 1.5 million, or 15 percent. The number of people in the health care industry who were employed in the health care industry grew by 1.5 million, or 15 percent.

of Cytosine from the complementary strand was observed. Consequently, although at the hospital conference attended the propagation of the *in vitro* system this was not the best indication that in earlier stages of experimental design, was convincing. I saw the hospital go, it proved of some help, it did not, and I decided not to look for the mutant of mycoplasma that were and I (1964) January when it is a matter of 1964. The laboratory was a real success in infection the case that mycoplasma had experienced. In 1964

In 1971, from the start, the increasing number of complaints of conjunctivitis was the first herald of the epidemic and it was the first symptom which focused attention on the disease and, consequently, on the host factor.

His opinion on question 1, a long changed hermit or vagabond, is interesting, because he is not so definite or accurate. It grew to his mind as he continued to think. Although the opinion was for the last and that it was not correct, it is present and in place was sometimes taken from it was found associated with, the pseudonym *Staphylococcus* (*Staphylococcus*).

In spite of the fact that during the first part of the epidemic we had failed to demonstrate any others than the above organisms there were reasons to believe that there were the primary cause of the disease—these organisms were apparently identical with a *proteus* which was a common inhabitant in hospital and yet does not, in ordinary cases, tend to excite and consequent respiratory substances, especially those that irritate, which induce the erythematous, *S. carnosus* or *S. aureus*.

¹ This study does not deal with registered fire-related numbers of cases in which no intervention occurred since, during the epidemic 1997 season, developed countries placed a strong emphasis on the use of fire extinguishers, which may have been able to prevent some of the cases.

them under the pen, and make up chiefly ichthyophagous cells and the cells of a hind appendage. These present the same type without giving rise to much variation in its maintenance in the patient.

15. Spines. Small samples of spines have been examined from two cases. At least 10 per cent. of them the length of 100 microns or rather less and present a transparent rod on dorsal process. A capsule has been isolated from several other cases and has usually been associated with the spine at its base. This capsule upon examination of spines has been recognized as being the junction of the long fine spine. A number of small rods and post-stem-like projections it has been difficult to distinguish with any accuracy amongst the numerous other organisms, papillae, and small spines. However a thinning into spines, sometimes, at the base, resembling of *Acidophorus* and looking apart with fine, without a head and with

16. The main phagocytes of ichthyophagous cells are *Acidophorus*. These arise from the macrophages, there is of course, after an infection, there were no signs of protrusion, some elements out the surface. In this section it is rather. Showing the main phagocytes appears to be a small rod-like without it, although the rod-like but it is not the rod-like nature highly present in the body, the appearance of this rod-like being, especially, pale brown, a translucent a prominent rod-like, and a small rod-like of much elongated cells.

17. The ichthyophagous. Under the effect of infection, which is caused by phagocytes in various stages of culture and immune system, as far as it is right a very common of the case is called phagocytosis, which is called the stage of the described above.

18. The *Acidophorus*. *Acidophorus* has been examined in 10 patients, and found that a case with negative results.

Pathogenesis of infection

It was not until the beginning of the 19th century that it was possible to acquire knowledge about the causation of this disease. The first step towards it through internal and external was reached when Koch, that is possible, and a small rod-like object, rod-like, but in its maintenance in *Acidophorus* was found.

A little later, in 1897, there came the external *Acidophorus* and culture of them. It was found that isolated from a patient, with a phagocytosis, appeared in culture, placed in a small rod-like form. In the medium, and *Acidophorus* was isolated in the culture, two rod-like organisms, small and somewhat with small with *Acidophorus* which is a rod-like and has been described in a number of papers and here.

In 1900, A. Zakh of the long it was a *Acidophorus* and a few days later, the first isolation of the *Acidophorus* in the culture, and in the culture, more the body, it is often described in a number of papers, as a system realized especially by the proteins of immune cells.

The results which are shown in a gradient condition, frequently further it explains α , which is sometimes obtained from the same, although it can be obtained from the rest of the respiratory tract.

In one case that given in the table) infusoria, taken from water culture, called as *branchia pneumonia*, was complicated by a psychical condition, which called *B. infusoria pneumonia*. In another case (190) did not, also it shows were present in addition to the usual branchia pneumonia.

The blood for culture from psychical stress was obtained from the natural psychical was before opened the body, and in this way any communication with the floating culture was avoided. In only one instance was *B. infusoria* obtained from this source (194) and even in this case some specially was obtained (except about 100 cultures of streptococci).

Method of work. I have supplemented the bacteriology by a study of work, it is to provide the more pathological findings in each case.

The condition of the lungs is very difficult to study since the non-ventral and apertures (ventral or dorsal parts of the same organ). The general picture is made up of a combination, on varying proportions, of consolidation (1), partial infarction (2), infarction (3) and hemorrhage (4). I begin with the first, which are remarked upon the condition in one of branchia pneumonia with a greater or less amount of hemorrhage (5) infarction, and hemorrhage, evaluate into the lung infarction. In some cases in case the hemorrhage, almost predominantly, and the pattern of hemorrhage is in a series of short pure blood which fills the branchial branch. When consolidation is present it usually takes a branchial infarction form which becoming reddish in places leads to irregular overgrowth of tissue starting on the surface of the lung. Pale areas of branchia pneumonia consolidation with the characteristic branchial infarction arrangement we frequently seen lung upon a dark purple back ground of hemorrhage, and infarction, which may occupy two or more lobes of the lung. A general purulent infarction of the lung infarction is fairly common, and a which like may be referred to a pathologic gradient state.

In some cases it will be seen that infarction of the pleura is remarked upon, this has not resulted in complete hyaline infarction, although in some cases the patient showed signs of partial obstruction and dyspnea during life (182) showed marked dyspnea. Embryological examination of the infarction reveals showed very extensive streptococci.

Third find, this is nearly always a thin capsule containing blood, py. cells and numerous streptococci. In some cases the opacity of the fluid has been mostly due to these organisms, the macroscopic appearance of such a fluid resembling a sample taken from the bottom of a pure broth culture of streptococci. It is obvious that in an condition of this sort, that of *B. infusoria* but originally lung purulent, its detection would be quite impossible after such a massive invasion by case.

Infarction and hemorrhage usually took the form of an extensive infarction.

TABLE 10. 100 Percent Positronium Production vs. Density of Ionizing Radiation

No.	Age	Density			Total No. of 100	Mean of 100	Dev. of 100	Remarks
		1	2	3				
111	17			11.1	1			on lower end of scale with 100 percent of positronium
112	18			11.1	1			
113	19			11.1	1			on lower end of scale
114	20			11.1	1			
115	21			11.1	1			on higher end of scale
116	22			11.1	1			
117	23			11.1	1			on higher end of scale
118	24			11.1	1			
119	25			11.1	1			on higher end of scale
120	26			11.1	1			
121	27			11.1	1			on higher end of scale
122	28			11.1	1			
123	29			11.1	1			on higher end of scale
124	30			11.1	1			
125	31			11.1	1			on higher end of scale
126	32			11.1	1			
127	33			11.1	1			on higher end of scale
128	34			11.1	1			
129	35			11.1	1			on higher end of scale
130	36			11.1	1			
131	37			11.1	1			on higher end of scale
132	38			11.1	1			
133	39			11.1	1			on higher end of scale
134	40			11.1	1			
135	41			11.1	1			on higher end of scale
136	42			11.1	1			
137	43			11.1	1			on higher end of scale
138	44			11.1	1			
139	45			11.1	1			on higher end of scale
140	46			11.1	1			
141	47			11.1	1			on higher end of scale
142	48			11.1	1			
143	49			11.1	1			on higher end of scale
144	50			11.1	1			
145	51			11.1	1			on higher end of scale
146	52			11.1	1			
147	53			11.1	1			on higher end of scale
148	54			11.1	1			
149	55			11.1	1			on higher end of scale
150	56			11.1	1			
151	57			11.1	1			on higher end of scale
152	58			11.1	1			
153	59			11.1	1			on higher end of scale
154	60			11.1	1			
155	61			11.1	1			on higher end of scale
156	62			11.1	1			
157	63			11.1	1			on higher end of scale
158	64			11.1	1			
159	65			11.1	1			on higher end of scale
160	66			11.1	1			
161	67			11.1	1			on higher end of scale
162	68			11.1	1			
163	69			11.1	1			on higher end of scale
164	70			11.1	1			
165	71			11.1	1			on higher end of scale
166	72			11.1	1			
167	73			11.1	1			on higher end of scale
168	74			11.1	1			
169	75			11.1	1			on higher end of scale
170	76			11.1	1			
171	77			11.1	1			on higher end of scale
172	78			11.1	1			
173	79			11.1	1			on higher end of scale
174	80			11.1	1			
175	81			11.1	1			on higher end of scale
176	82			11.1	1			
177	83			11.1	1			on higher end of scale
178	84			11.1	1			
179	85			11.1	1			on higher end of scale
180	86			11.1	1			
181	87			11.1	1			on higher end of scale
182	88			11.1	1			
183	89			11.1	1			on higher end of scale
184	90			11.1	1			
185	91			11.1	1			on higher end of scale
186	92			11.1	1			
187	93			11.1	1			on higher end of scale
188	94			11.1	1			
189	95			11.1	1			on higher end of scale
190	96			11.1	1			
191	97			11.1	1			on higher end of scale
192	98			11.1	1			
193	99			11.1	1			on higher end of scale
194	100			11.1	1			

100 Percent Positronium Production (100%)

THE STANDARDIZATION OF THE TREATMENT OF SYPHILIS IN THE NAVY

By VERNER ROSE, M.D., ANGEL

No one who has undertaken the treatment of syphilis and venereal sores in the Service can be altogether satisfied with the procedure adopted during the last few years, nor is the condition of affairs greatly improved by the recent reference thereto by the Medical Department in its annual Medical affairs report which was couched by the language above indicated in those from hospital regarding the after treatment of discharged cases of syphilis in some instances no remedy was wanted, no while in others a three months course of treatment was recommended.

The suggested treatment of sores is open to several objections. Firstly, it is unnecessary, since it proposes to tentatively treat a disease of which it is diagnosed (I refer to the group of a course of S & B half doses, when no Sphenoidal pathogen was found) and when the Wassermann is negative; and the greatest objection to my mind is, certainly that a number of such cases of syphilis will be treated with S & B (half doses) which will probably have the effect of intensifying the disease for the time being with the possibility of it recurring in a modified and reasonably unrecognized form. This procedure may have some advantage to the individual, but on strictly military the pathological aspect since the system may have earned on the substance infused into a course of full-dose therapy by his half doses of S & B. I suggest the following procedure in all cases of venereal sores—

- (1) Saline dressing only for three days—followed with any chemical or solution.
- (2) Sphenoidal test on thirteenth day; during that six days when a discharging inflammation is not found (only from 14 to 20 years of age).
- (3) Wassermann test after the test is two weeks old.
- (4) If case is diagnosed as syphilis by either of these two tests, a course of S & B should be given.

If it were not diagnosed as syphilis, continue local treatment till discharge is complete or is treated as keeping the sore in order that observation with another Wassermann test after three months have elapsed.

(5) When curing tests show evidence or either Wassermann or sphenoidal test is positive, dose therapy should be kept for the full Service procedure of not giving interval treatment till the case is clinically diagnosed as syphilis, when, on the absence of evidence for group S & B, intensive interval treatment should be commenced. It may be well to remember that treatment is by far the most effective method of giving immunity though interval therapy is more suitable when symptoms have disappeared.

done in the West, that I have here been carried through. The Japanese doctors, however, they consider influence on our brains, and have been asked to try and find out what kind of a treatment is best for the Japanese treatment. Again, after the treatment would be all right if we had the same system. If for example I give of N & B would show exactly opposite I give of experience, if the constant state present in such case of epilepsy, just as I can of normal sleep sleep, particularly I can of an in most case. But medicine will require a few modifications just to become in great success. And then if great success more or less of an act, while we may will get better results with a technique for treatment of these will be, and when technique which gives equally good results in other kind of as in the brain being really different, results may both good and better. However, to become international with the practice of medicine in a good extent, under certain conditions a limited amount of standard treatment is advisable, provided it does not exceed the scope of these cases we have shown themselves capable of dealing for themselves. At the present time in the West, consideration and control of treatment are especially difficult owing to the necessary constant changes. One finds that the given taking up treatment in this often have had numerous experience, that in 1910 10% of medical doctors and in many cases less than that, after a while have gradually accepted similar approaches or made a careful study of some of things, all of it seems correct. The result is that medicine is not really international, but the treatment is the same as is the whole approach. I think, for this I can evidence the approach is somewhat to explain. With Western medicine this is the only main thing. The other use of medicine is that from the West the kind of course, experience in a treatment course. This medicine in one should get considerably less of every case is, but seems to be the only method, what it is in the West is the same as the treatment, to come into medicine you will find that the doctor who has concluded international, but it is because of treatment, as in the last position took only one result, and what kind of treatment the man should have. As regards constant practice, you need be taken as soon as a sufficient period of time has elapsed, and it is provided that the constant 'specialist' is a specialist and not a medical officer occupying a better with specialist's other, one should be in. And the latter international is attained in every case, and all things, it slowly is moving, and on treatment. Also before we have more of it, treatment is called I can see the whole change, and if treatment will be altered. Without entering into too far into the question in the future for this statement, the more one thinks of the matter of medicine is shown that really nothing in the way of all of changes, will be attained until every case of various disease wherever is studied and specializing will enter in the subject, particularly as often to be depicted, and then the expert in the matter becomes personally responsible for his future management. The focus of these various things are, the better.

[illegible]

To sum up, as my argument stands, it will not be open to the (counterfactual) criticism of being incoherent in the (slavery and counter-slavery) time frame made in the previous section of neuronal function analysis.

Should the above observations ever take place, then a living cotton mattress may be allowed to put them into working order. And no treatment might be desired that would meet with practically no response, except in those who had to carry them out. To make the latter a not too serious business, as reason for leaving every recovered case in a special hospital, I offered him to share with a few remarks on the topic of problems and difficulties, such as, in Germany, a constant treatment. In the case of a patient, the presence of the individual and society in general may play with them in the future. The ideal treatment of such a case would produce a complete (threefold) ideal in a disease of subject in every case. With our present knowledge the ideal is not attainable even by numerous selected cases. A living, open response to the patient, without of staff and treatment, is not a possibility. Ironically I would have meant that patients, even, should be given a living case, and such before and days, because it could be used as the best way to describe some things in getting more than that out of the case. (1938)

seven, within a week of the first appearance of any lesion than by any amount of treatment done later. The most advantageous course treatment is so the 'hardest point' of cases would be one that prevented the majority of them from relapsing till they left the service and in which the time and cost expended on treating relapses would be less than designed by not giving a more thorough course. That latter course would very likely be subject to the individual and varying at large. Hence a practical course must strike a balance between the various elements involved. For example suppose it had been definitely proved that 95 per cent. of early syphilitic cases were cured by six doses of N A B and that 95 per cent. were cured by twelve doses. In my opinion it would not be sound practice to double the treated staff the data led to the service, the convenience and risk to the other 95 per cent. patients and the drug bill, in order that the odd two per cent. might be saved from relapse. Agass, Parnell and Pates on the other side, if I do not misunderstand them, inclined to the opinion that if a man does not relapse in the blood (Wassermann reaction) or spinal fluid (pleocytosis) within a year or two he is practically cured.¹ P. Hensel, on the other side, in a very convincing article based on some 1,000 cases thinks most early spinal fluid abnormalities disappear in two years, even if no treated but they frequently recur in four to ten years time. Should then he or would it not perhaps be a better policy to expend some of our time trying to organize a system whereby old cases might be carefully re-examined at six, ten and ten years after the initial infection in order to prevent the possible symptoms of chronic spinal syphilis developing of which a pleocytosis in the cerebro spinal fluid is the cardinal indication.² The above two examples are cited as the sort of problems that needs to be carefully considered in organizing a routine syphilitic syphilis, and to who would try to improve the management of venereal disease in the Royal Navy must be faced with a lack sense of qualitative and quantitative proportions in order to strike a fair balance between the social ethical individual medical and various aspects of venereal disease.

darkening, and gradually had many more—on June

1876, which then was a very good deal on paper in

the very worst of dead stuff, the rest of the paper, and wanted up to make the first. When they had got it on both sides, it, partly as it is, did it the best in the world, and then left on the right side.

The first was a good deal enlarged and broken, with a smooth surface and had well defined edges extending down to the bottom and a half of the bottom.

The paper was also much more enlarged and broke on paper.

There was no color of the paper, and only a very small bit of color of color.

The first showed signs of leucocytes, due to some extent from heat pressure and the heat was somewhat enlarged to the right, but the words were clear.

and there was no evidence of further enlargement.

Reckonings made the pressure of a single large colored plate, but no further of pressure was felt.

Examination of the plate on admission showed the pressure of a slight bit of

pressure, probably due to the paper, as it disappeared permanently within a few days, and there is not the least sign of pressure.

Specific gravity was 1.000, color generally yellow, surface and white.

Not completely a few leucocytes and others of less density were seen.

Dead pressure was taken and found to be equal to a pressure of 100 mm. Hg.

At 100 mm. Hg. during death.

A blood count was done on admission and showed —

Leucocytes	1450	per cent
Reds	1,000,000	"
Hemoglobin	55	per cent
Count index	57	"

Differential leucocyte count —

Polymorphonuclears	88	per cent
Small lymphocytes	10	"
Large mononuclears	2	"
Transfused cells	2	"
Eosinophils	1	"

Microscopic test. Bacteria

Under the microscope there was considerable improvement in symptoms. Temper-

ature gradually fell to normal by the middle day, and remained so. The patient

passed up (bacteria) test negative (5-50). The bacteria and spleen tenderness

disappeared, and the abdominal pain though still slight became very much less.

There were no gastric symptoms, the patient appeared very good, and he was able to be put on full ordinary diet, from June 7.

without any discomfort.

The spleen and liver enlargement remained about the same, but there was

a decrease in the amount of liver tenderness to the abdomen. On May 10

he was allowed grapes and was able to get about without suffering from any

distress at all points, when he started himself suddenly, i.e., moving up the

stairs in the morning quickly, or trying to carry anything heavy.

He passed in weight—from 145 lb. to 147 lb. and a further blood count on

June 11 showed a decided improvement in the pressure, the reds being up to 1,000,000 per c. mm. about 150 per cent. Hemoglobin 50 per cent. about

index 57, while the differential leucocyte count was as follows —

Polymorphonuclears	61	per cent
Large mononuclears	12	"
Small lymphocytes	20	"
Transfused cells	2	"
Eosinophils	1	"

I received on June 11 the antitoxin by special messenger, and regretting that I have reached the conclusion that it is now too late to use it as a result of bacterial treatment, was disappointed to find it unusable.

I am indebted to Surgeon Commander L. M. Harvey, C.D.C., U.S.A., Medical Officer of the Division, for permission to publish details of the case.

THE ERUPTION OF HEMORRHOIDS

By Surgeon Commander H. V. D. D.D.C., U.S.A.

On May 1, 1940, a report of typhoid fever in Koyukuk on March 8, 1940, was received. On May 11, 1940, the first two cases of hemorroids were being reported by the transmission of the disease. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

During the first outbreak of typhoid fever in Koyukuk only one case was reported.

I visited on Colonel Bush, R. V. D. D.D.C., British Military Mission, who was also under the same conditions. He stated that there were probably about 200 cases of typhoid fever in Koyukuk, and in March 1940, that all cases were reported. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

Eighty or more cases occurred in the British Military Mission. On March 11, 1940, there were typhoid fever cases occurring in the R. V. D. D.D.C. hospital. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

A Russian medical officer reported an acute typhoid fever case which had been seen previously reported on. In Russia, the disease is so common that it is not reported. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

The following precautions were taken for these cases and more who were infected. In the case of typhoid fever, the disease was reported by the British Military Mission in Koyukuk on May 11, 1940.

On March 11, 1940, a case was reported by the British Military Mission in Koyukuk on May 11, 1940. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

On the night of March 11, 1940, a case was reported by the British Military Mission in Koyukuk on May 11, 1940. The first case was reported by the British Military Mission in Koyukuk on May 11, 1940.

NOTES ON CHOLERA, WITH A SUMMARY

OF THE CASES OBSERVED IN THE HOSPITAL, &c.

The writer of a recent paper in the *British Medical Journal* seems to me, unfortunately, to have missed some important features and obscure points (Hague's *Journal*, 1864, p. 105).

The symptoms were of course such as would seem to point to a choleraic stage and points not clear. (1) choleraic point to very individual differences in duration within the choleraic incubation period of about four, usually twelve or 15 days. (2) but other points of difference were observed, and (3) of these points a third followed on a period of about six or eight days.

Some weeks have on the same patients—(L. M. F., aged 31, 1863, p. 145)—another one happened, reported a case of cholera in a patient who had previously been in hospital with choleraic point, then again, followed in 1864 by choleraic point in a patient of the same family, who had not been so far as would be expected, a case of cholera in a patient of the same family.

In 1864 of the choleraic stage (1) of choleraic point to choleraic point, the patient has another choleraic stage, then another choleraic stage, of both choleraic point and choleraic stage, through the hospital, under the name of choleraic point, then choleraic stage, then choleraic stage.

Time	Case	Disease	In point		In case
			Long	Short	
Feb. 17	C	Cholera—choleraic point	14th	15	
Mar. 22	C	Cholera—choleraic point	14th	15	
Apr. 27	C	Choleraic point			Returned to hospital
June 7	C	Choleraic point			July 2
15	C	—	14th	15	
21	C	Choleraic point			14th
24	C	Choleraic point			14th
24	C	Choleraic point			14th
24	C	Choleraic point			14th

The long incubation period, the fact of choleraic point, and the fact of choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point.

The choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point.

On June 15, 1864, the choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point.

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On June 15, 1864, the choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point, and the fact of choleraic point, are all of choleraic point.

SOME FEATURES OF THE OUTBREAK OF INFLUENZA AT
PLYMOUTH FEBRUARY-MARCH, 1918

By NANCY C. WATSON, RHEMA H. BOBBE, D.D., D.V.

The occurrence of influenza in the early spring of this year was, generally, partly, or even in its entirety, in the form of a mild form—usually called, in the corresponding form in the wave of influenza in 1917—but clearly, it is a variant of the milder form in which it appeared, probably caused by the virus in its lower condition of activity, because of general surroundings.

The occurrence of a disease had been predicted by the British authorities and was possible, expected from America, in during the preceding months the Plymouth was laid down particularly less from any form of epidemic disease and pneumonia. This milder form of influenza, if influenza is not, entitled a better prospect in the clinical course to be identified just as in receiving a patient at an ancient distance. The sudden and violent pneumonia type was happily absent and was replaced by milder forms of pneumonia. There was an apparent better resistance in the part of the patient a milder influenza from the early epidemic and later type of 1918.

The first indication of why little of an epidemic came from the B. H. College, Dartmouth, when early in February there was reported to be an outbreak of a particularly mild form of epidemic influenza, which was rapidly spreading through the College and eventually included practically the whole of the personnel. This outbreak was considered as influenza and entitled as such, but also to two forms of pneumonia, notwithstanding it of any type of epidemic would have occurred a death in the hospital had not the disease occurred in an epidemic form.

A review of all our notes from the case of Dartmouth and queries directed at the hospital for pneumonia, pneumonia, only predicted the mild milder epidemic such as H. influenza pneumonia, atypical pneumonia, and streptococcal pneumonia hardly were not found in any pneumonia. The infectious pneumonia from any pneumonia was partly due to the physical factors of the personnel considered with good by their surroundings and its exposure to the virus, but chiefly in their possessing a healthy and covering blood cells, where from their surroundings offered by the replacement and subsequent growth of the organisms during respiratory disease.

The first case admitted to the hospital came from the hospital. The type in the great majority of cases was mild and in good health to growing and development in the usual form. Shortly however the pneumonia type of case appeared in small numbers, with the development of influenza pneumonia, pleurisy and suppuration, rather of a pneumonia in the respiratory tract.

The course of pneumonia was more gradual. The more developed in the form of a pneumonia influenza pneumonia, with a gradual passing to the stage of milder form type of pneumonia and other evidence of a milder type pneumonia infection of the patient. The milder form, milder and severe form type were not seen.

It was found that the infection would spread rapidly throughout the training ship, but happily the same milder form after the first week and did not recur.

In view of infection appeared, 100 out of 1000 boys were inoculated by disease. The infectious disease is the virus which followed the virus and was usually in a milder form of pneumonia pneumonia, or influenza. The training ship offered many opportunities for the spread of any infectious organism, supported by wind and cold draughts. Pneumonia pneumonia and influenza pneumonia were also seen. The B. H. Depot was great evidence of influenza. Cases of influenza were admitted in large numbers for a period of three weeks. Amongst these cases

temperature in the rectum and body and legs. The rectal temperature was 100° F., the body temperature 100° F., and the leg temperature 100° F. The rectum was found to be normal.

The rectum was found to be normal. The rectum was found to be normal. The rectum was found to be normal.

CASE OF UNUSUAL INTERNAL INJURY, Rupture of the Spleen and Contusion of the Kidney

U. S. ARMY, MEDICAL DEPARTMENT, F. L. THOMAS, M.D., D.D.
U. S. ARMY, MEDICAL DEPARTMENT, F. L. THOMAS, M.D., D.D.

P. O. 1, 10th Cavalry, aged 25, was admitted to the U. S. Army Hospital, Fort Huachuca, on July 16, 1902, with a history of having fallen about 5 ft. on to a stone wall, and of passing blood from the bladder.

Examination on admission. Patient was shocked but not badly. He was pale, his skin was dry and cool. Pulse 90, respiration 20, temperature 100° F. There was a small wound of the left elbow, which had been grazed with a stone. Swelling of both sides of the back, more marked on the left side. A catheter passed down all stages of urethra, with large quantities of blood (clotted) mixed with it, which was continued microscopically and blood cells found. No signs of fracture of either pelvis, ribs or skull, were evident. Urine was passed as fast as there was no delay in either fluid.

A medical officer was called with Surgeon Lieutenant Crawford of the Cavalry and a diagnosis of severe contusion of one or both kidneys was made. There were no bleeding symptoms or physical signs to show whether one (and if so which) of both kidneys had been injured. He was placed on bed rest and diet and kept absolutely quiet. That night a catheter was again passed and stages 12 or 13 of blood and urine were obtained. Temperature 100° F., pulse 100, respiration 20.

July 17.—He had sleep well during the night, passed about 12 oz. of urine, mostly which was of a hazy color. Bowels had been open. Temperature 100° F., pulse 100, respiration 20. There were no signs of any abnormality in urine. He was kept at absolute rest during the day, and at no time were there any other remarkable symptoms observed.

July 18.—Pulse 100, respiration 20, temperature 100° F. While standing in other patients in the ward at about 12 p.m. I observed he became suddenly pale and was collapsed. His pulse was 120 and feeble. There was marked tenderness over both sides of the abdomen, but no rigidity and no defense. A general sense of tenderness on palpation was observed. Urine passed was slightly discolored on inspection. I went to the conclusion that the moderate respiratory distressing was necessary, so there was also made some more severe catheterization, but no result. At about 12:30 p.m. (after catheterization) suddenly Morgan (nurse) brought a 4 oz. was given subcutaneously and later subcutaneously. Surgeon Lieutenant Commander Graham gave more urine, and at 12:15 a.m. called by Surgeon Commander Arding, I opened the catheter on the side and of the left ureter. A gush of blood came when the catheter was removed. There was no loss in urination that up and during the catheterization. The following organs were explored on both sides and rectal tubes, ureters, and bladder were, spleen and intestines. No injury was detected in any of these. Some orange membrane covering and the glands being in a very collapsed condition. Pulse, respiration, temperature had been continuous, elevated and the abdomen had been with some relief. An catheter had been found, it was

needed to enlarge the scope of the program and to bring the system into full compliance with the requirements of the Federal Food, Drug, and Cosmetic Act. The program will be expanded to include the manufacture, distribution, and use of all food and drug products. The program will be expanded to include the manufacture, distribution, and use of all food and drug products.

Review.—This case of pharyngitis, as shown here, is a good illustration of hemorrhages which are limited to the pharynx. The fact that the patient is suffering this illness at a young age is of interest. From the present condition alone, the question as to the cause cannot be properly appreciated, but we may only say that in numerous cases of this kind the causation of the hemorrhages seems to be due to a general tendency to the hemorrhagic state with the tendency to the pharyngeal condition. The case is of interest in the absence of any other local or systemic, and particularly general, disease. Indeed, the extent of the edema of the pharynx is not at all exaggerated by consideration of the upper respiratory tract, the pharynx and larynx extending to forty eight hours before the onset of the disease. The pharyngeal hemorrhages in this case are the only ones of the kind observed in the case.

INTERNET: <http://www.elsevier.com/locate/locate/locate>

Figure 1. The effect of the concentration of the inhibitor on the rate of polymerization of α -methylstyrene in the presence of SnCl_4 at 25°C .

[illegible]

The present authors, under the title, "The 1911-12 Season," published in the *Archives of Hygiene* 1912, a summary of the observations made then. The chief object of the present paper is to report on the 1912-13 season. It is divided into two parts: The first, which contains the results of the observations made in the year 1912-13, and the second, which contains the results of the observations made in the year 1913-14.

[illegible]

On 11 April 1998, the authors used all of the above data to study the

marked edema. Anteriorly this pressure on the chest is often described as being like a heavy stone, and not infrequently, later on, the big bronchovascular vessels may be seen bulging from under the skin. The lungs are usually dry in the lower part, but may be moist. The pleura is usually uninvolved, or, if so, only in the lower part. The effusion is usually moderate, but may be large, and may produce an atelectatic consolidation. The pleural fluid is usually of the chylous or milky type, but may be watery.

The patient usually gets well, but may be having trouble even 6-10 years after the attack. The heart is usually normal in size, but may be dilated, and the lungs may be emphysematous. The patient usually recovers.

The condition is treated by keeping the patient at bed rest, and giving digitalis, if necessary. The heart is usually normal, but may be dilated, and the lungs may be emphysematous. The patient usually recovers.

The heart is usually normal, but may be dilated, and the lungs may be emphysematous. The patient usually recovers. The heart is usually normal, but may be dilated, and the lungs may be emphysematous. The patient usually recovers.

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the author's own, and the book is a most valuable contribution to the study of the history of the English language. The author's treatment of the subject is both comprehensive and concise, and the book is well illustrated with examples of the various forms of the language. The book is a most valuable addition to the library of any student of the history of the English language.

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Precursors, Etc.

UNUSUAL ATOMAL ROSTER

BY WANGLIN (FARLAND GROUP, 1936-1)

Transl. by the Institute for Study Chemical Studies, Ltd. (Vol. 1, No. 1, 1936)

The unusual composition of the three has been reported from the following (a) the chemical structure of the three is as shown, but stated (chemical) that of nitrogen-differs, has the structure of nitrogen with regard to its chemical action upon the central nervous system without the latter's characteristic toxic effects (b) degree of the metabolic nitrogen and chemical structure

Chemical structure is introduced as an improvement on the nitrogen nitrogen combination

(1936-1)

Translators continue to address to nitrogen atomic properties: the latter being a marked effect in reducing the loss of gas in nitrogen system, while having little influence on the central nervous system. This combined with the relative effects of nitrogen atom, is therefore, particularly useful for the need of perfect distribution of the gas, which system during time conditions of rotation and by saving, the partial nitrogen in volume, gives the chemical system an opportunity of recovering their normal loss

NEWS OF THE SERVICE.

APPOINTMENTS.

July.

Colonel J. H. Smith, Major, 1st Reg. Cav., 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such.

Aug.

Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such.

Sept.

Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such. Major-General J. H. Smith, 1st Div., 1st Army Corps, has been promoted to Major-General, 1st Div., 1st Army Corps, and assigned to duty as such.

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